





Government  
Publications













Digitized by the Internet Archive  
in 2022 with funding from  
University of Toronto

<https://archive.org/details/31761115508400>







Nov. Joe  
an  
9

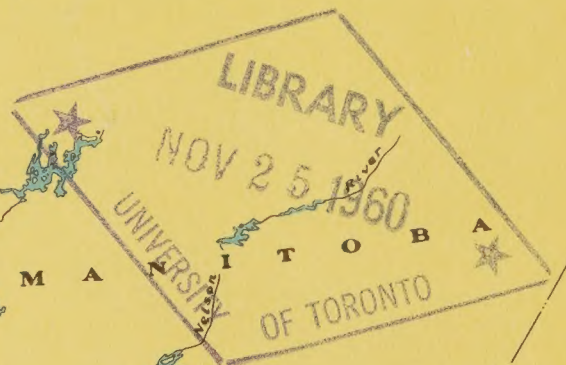
7199

• CANADA • DEPARTMENT OF AGRICULTURE •  
• PRAIRIE FARM REHABILITATION BRANCH • REGINA •

AI DA 20  
A56

# Annual Report

1958-59



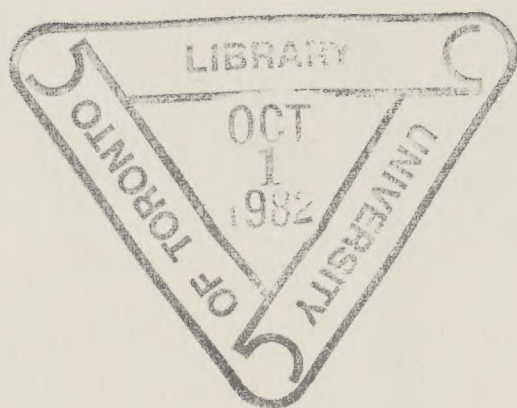
P.F.R.A. AREA

P.F.R.A. BOUNDARY

ON PRAIRIE FARM REHABILITATION  
AND RELATED ACTIVITIES

1958/59







# TABLE OF CONTENTS

INTRODUCTION	1
ADMINISTRATION and ORGANIZATION	4
WATER DEVELOPMENT PROGRAM	7
Farm Projects	7
Community Projects	8
Large Water Development Projects	4
Brown Hill Project	5
Vidualet Creek	5
Rushmore Water Storage Project	5
St. Mary Storage Project	7
Sawtooth Creek Project	7
Mary Jane Creek Storage Project	7
Technical Assistance	9
Special	10
PRAIRIE FARM REHABILITATION	
COMMUNITY PASTURE PROGRAM	11
Pasture Development	11
and RELATED ACTIVITIES	
Pasture	11
Fairs	11
Breeding Service	14
Diseases and Special Services	14
Livestock Insurance	15
Hay and Cattle Feed	15
Ranching	15
Fires and Fire Prevention	15
Pond Construction	15
Pasture Improvement	15
REHABILITATION and RESETTLEMENT	22
Valley Irrigation Project	22
East Valley Irrigation Project	24
Exterior Irrigation Project	24
Comal Irrigation Project	25
South Canyon Irrigation Project	26
Mesa Creek Irrigation Project	27
Big River Resettlement Project	28
MAJOR IRRIGATION and RECLAMATION PROJECTS	32
St. Mary Irrigation Project	32
Improvements and Construction	34
Project Improvement	34
Operation and Maintenance	34
Agricultural Development	35

1958 - 59







# TABLE OF CONTENTS

	Page
INTRODUCTION .....	i
ADMINISTRATION and ORGANIZATION .....	ii
WATER DEVELOPMENT PROGRAM .....	1
Farm Projects .....	2
Community Projects .....	4
Large Water Development Projects.....	4
Brown Hill Project .....	5
Valeport Dyke .....	5
Rosthern Water Storage Project.....	5
St. Malo Storage Project.....	7
Sunbeam Creek Project.....	7
Mary Jane Creek Storage Project .....	7
Technical Assistance .....	9
Special Services.....	10
COMMUNITY PASTURE PROGRAM .....	11
Pasture Operations .....	11
Pasturage .....	13
Fees .....	13
Breeding Service .....	14
Diseases and Special Services .....	14
Livestock Insurance .....	15
Hay and Grass Seed .....	15
Regrassing .....	15
Fires and Fire Prevention.....	15
Pasture Construction .....	15
Pasture Improvement .....	18
REHABILITATION and RESETTLEMENT .....	22
Val Marie Irrigation Project.....	22
West Val Marie Irrigation Project .....	24
Eastend Irrigation Project .....	24
Consul Irrigation Project .....	26
Swift Current Irrigation Project.....	26
Maple Creek Irrigation Project .....	27
Bow River Resettlement Project.....	30
MAJOR IRRIGATION and RECLAMATION PROJECTS .....	32
St. Mary Irrigation Project .....	32
Investigations and Construction .....	34
Project Improvement .....	34
Operation and Maintenance .....	34
Agricultural Development.....	35



# TABLE OF CONTENTS (continued)

	Page
Bow River Irrigation Project .....	36
Construction .....	36
Renovation and Maintenance .....	37
Drainage .....	38
Operation and Irrigation .....	38
Resettlement .....	38
Pastures .....	39
Agricultural Development.....	39
South Saskatchewan River Project .....	41
Construction .....	41
Field Operations .....	43
Pre-development Farm .....	44
Buffalo Pound Lake Water Supply Project.....	45
Saskatchewan River Reclamation Project .....	47
Sipanok Area .....	47
Pasquia Area .....	47
Construction.....	47
Operation .....	48
Field Investigations .....	49
Northwest Escarpment and Interlake Reclamation Projects .....	49
Riding, Duck and Porcupine Mountains .....	49
Surveys .....	49
Construction.....	50
Interlake Reclamation Area .....	51
Surveys .....	52
Construction.....	52
Assiniboine River Project .....	52
Upper Assiniboine River .....	52
Surveys .....	52
Lower Assiniboine River .....	53
Surveys.....	53
Construction .....	53
Rivers Water Storage Project .....	54
British Columbia Projects .....	54
ENGINEERING SERVICES .....	57
Design Division .....	57
Soil Mechanics and Materials Division.....	58
Air Photo Analysis and Engineering Geology Division .....	60
Hydrology Division .....	61
Individual Project Studies .....	62
Watershed Studies .....	62
Miscellaneous .....	62
Drainage Division.....	63
Bow River Irrigation Project .....	64
Groundwater Observations .....	64



# TABLE OF CONTENTS (continued)

	Page
Surveys .....	64
Special Investigations .....	64
Maple Creek Irrigation Project .....	65
Land Classification Studies .....	65
CONSTRUCTION, EQUIPMENT and SUPPLY DIVISION .....	66
LAND INVESTIGATION and APPRAISAL DIVISION .....	68
PLANNING and INFORMATION DIVISION .....	69
APPENDICES .....	71
Appendix I	
Water Development Program – Number of Projects and amount of financial assistance paid from 1935 to March 31, 1959 .....	71
Appendix II	
Water Development Program – Progress by years in the construction of of Individual, Neighbor and Community Projects .....	72
Appendix III	
Community Water Development Projects – Constructed in 1958 .....	73
Appendix IV	
Large Water Development Projects – Constructed 1935 to March 1959 .....	76
Appendix V	
Development and Operation of Community Pastures under the Prairie Farm Rehabilitation Act – 1938 to March 31, 1959 .....	80
Appendix VI	
P.F.R.A. Community Pastures in Operation during the fiscal year ended March 31, 1959 .....	81
Appendix VII	
Major Projects – Irrigation Reclamation, administered by P.F.R.A. to March 31, 1959 .....	84
Appendix VIII	
Prairie Farm Rehabilitation Act – Expenditure by activities April 1, 1935 – March 31, 1959 .....	86
Appendix IX	
Expenditures by Provinces .....	88
Appendix X	
Total Irrigation Developments – Saskatchewan and Alberta .....	89

# PLANS

	Plate Number
Small Water Projects per township .....	I
Large Water Development Projects .....	II
Community Pastures .....	III
Bow River Project – Hays Resettlement Area .....	IV
St. Mary Irrigation Project .....	V
Sketch of Bow River Project .....	VI
Sketch South Saskatchewan River Project.....	VII
General Location Plan – Manitoba Regional Projects .....	VIII
Saskatchewan River Drainage Basin (Pasquia Area).....	IX



## INTRODUCTION

The Prairie Farm Rehabilitation Act was passed by the Parliament of Canada in April 1935 to provide for "the rehabilitation of the drouth and soil drifting areas in the Provinces of Manitoba, Saskatchewan and Alberta". The Act provided for the spending of one million dollars a year over a period of four and three quarter years, to alleviate the immediate problems created by the prolonged drouth being experienced in Western Canada. Provision was made by the Act for the promotion of new and improved cultural practices to control soil drifting and for the conservation of surface water resources for agricultural purposes. To cope with further problems affecting agriculture at that time, the Prairie Farm Rehabilitation Act was amended in 1937 to make provision for the establishing of a land utilization and resettlement program. By further amendment in 1939, this Act was to remain in force indefinitely. With these amendments and additional financial allocations, a long-term water conservation and land utilization program has been developed under the terms of the Prairie Farm Rehabilitation Act.

The area within the boundaries established by the P.F.R.A., contains approximately 110 million acres of land. Some 50 million acres of improved farm land, which is more than half the total improved agricultural acreage in Canada, lies within this area. In addition to supervising water conservation and land utilization programs throughout the P.F.R.A. area, the organization which has developed to administer the Prairie Farm Rehabilitation Act, has in recent years been made responsible for major irrigation and reclamation projects in Western Canada. These are projects which because of their size or location, are not included in the regular P.F.R.A. appropriation but are provided for by special votes of Parliament.

The P.F.R.A. program is designed to bring about desirable adjustments in agricultural practices which will assist in establishing a sound and progressive agricultural economy in Western Canada. By encouraging diversification of agricultural production, this program has already been effective in developing increased stability and security of farm income. The conservation of water on farms and in rural communities, and better land utilization, help to counteract the problems created by drouth.

Although this report will deal principally with the work done by P.F.R.A. in 1958, it will also review in a general way, the progress of the various programs and projects developed under the supervision of P.F.R.A. since its inception in 1935.







## ADMINISTRATION and ORGANIZATION

The Prairie Farm Rehabilitation Act is administered by a Director who is responsible to the Deputy Minister of Agriculture in Ottawa. The Director's office is located at Regina, Saskatchewan, where headquarters for the administration has been established. In addition to the Director's Office the organization at Regina consists of the Water Development Branch, the Community Pasture Branch, and the Engineering Services Branch.

The Director's Office co-ordinates the activities of the different Branches and administers the Resettlement and Rehabilitation program. The Construction, Equipment and Supply Division; Land Division; Planning and Information Division; and Administration Division are directly responsible to the Director.

The Water Development Branch supervises the development of an extensive program of farm and community water storage projects, and numerous small scale irrigation schemes.

The Community Pasture Branch undertakes the construction of new pastures and supervises the operation and maintenance of the existing Community Pastures throughout Saskatchewan and Manitoba.

The Engineering Services Branch, composed of the following Divisions – Hydrology, Soil Mechanics, Design, Air Photo Analysis and Engineering Geology, Surveys and Drainage – performs all engineering services for the investigation, design, and construction of all projects under P.F.R.A. administration.

In addition to the Head Office in Regina, there are District, Regional, and Project Offices situated throughout the Western Provinces. From the Project Offices there is usually a further breakdown to Field Offices, the number depending upon the size and type of the project being administered by the Project Office.

Since P.F.R.A. activities are closely allied to those of certain Provincial Departments, every endeavour is made to co-operate with these agencies. Similarly the P.F.R.A. maintains a close liaison with other branches and departments of the Government of Canada, such as the Experimental Farms Service, Science Service, Economics Division and the Water Resources Branch of the Department of Northern Affairs and National Resources.







## WATER DEVELOPMENT PROGRAM

As a result of prolonged drouth conditions in the early 1930s, farm water supplies had become critical on many farms throughout the drought area of the Prairie Provinces. To improve farm water supplies one of the first programs established under the Prairie Farm Rehabilitation Act was to provide financial and engineering assistance in the development of surface water resources for domestic use, stockwatering and small scale irrigation. This assistance in the establishing of reliable water supplies for farm use made it possible for many farmers to rehabilitate themselves without having to move to a new location. In recent years the assistance given by P.F.R.A. in the development of water storage on farms and in rural communities is proving to be a valuable incentive in the conservation of surface water resources. Since 1935, over 60,000 water conservation projects varying in size from individual farm dugouts to community dams, have been constructed under the P.F.R.A. water development program.



Sprinkler irrigating a farm garden with water from a dugout.

Ref. No. 1267

Projects which involve the construction of a small dam or dugout to serve either an individual farmer or neighboring farmers, are known generally as "farm projects". When a larger number of farmers or a rural community benefits by the development of a water conservation project, it is then



classified as a "community project". The construction of both "farm projects" and "community projects" is under the supervision of the Water Development Branch of the Prairie Farm Rehabilitation Administration. In addition to the water conservation projects supervised by the Water Development Branch, the Federal Government through P.F.R.A., undertakes the construction of large water conservation projects in communities where there is a special need. These are known as "large water development projects" and are constructed only where the Government of Canada believes them to be in the best interest of Canada as a whole.

In 1958 there was a very limited runoff in many of the watersheds in the P.F.R.A. area. The drouth, which commenced in 1957 in many districts, continued in 1958 with only very light and irregular precipitation in most areas. In August there were many dry farm dugouts and dams in south-eastern Saskatchewan. The drouth conditions and the availability of construction equipment resulted in a very large number of farm reservoirs being constructed during the 1958 season.

### Farm Projects

Individual or neighboring farmers are granted direct financial assistance in the construction of dugouts, dams or dykes for water conservation on their farms. The amount of financial assistance is based on the type and size of project and during 1958-59 amounted to approximately 30 % of the total cost of farm projects. During the latter part of the year authorization was given to a change of rates of financial assistance given for the construction of "farm projects". The rate for earth work was increased from 4 1/2¢ to 7¢ per cubic yard; the maximum grant for a dugout was increased from \$125.00 to \$250.00; the maximum grant for a stockwatering dam was increased from \$150.00 to \$300.00; the maximum grant for an irrigation project was increased from \$350.00 to \$600.00, and the maximum grant for neighbor projects was increased from \$500.00 to \$1000.00. This will increase the percentage of the total cost paid by the Federal Government to possibly 60 %. In addition to financial assistance received, all engineering services are provided free of charge. The responsibility for actual construction, however, remains with the individual or neighboring farmers who make application for assistance with the project.

During the 1958-59 season, financial assistance was paid on 3,682 farm projects which was an increase of about 44 % over the preceding year. Of this number, 3,257 were dugouts, 264 were stockwatering dams, and 161 were irrigation projects, bringing the total number of farm projects constructed since the inception of P.F.R.A., to 59,776. Seven hundred and ninety of the 3,682 projects constructed in 1958-59 were built in Manitoba, 2,114 in Saskatchewan and 778 in Alberta.



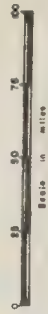
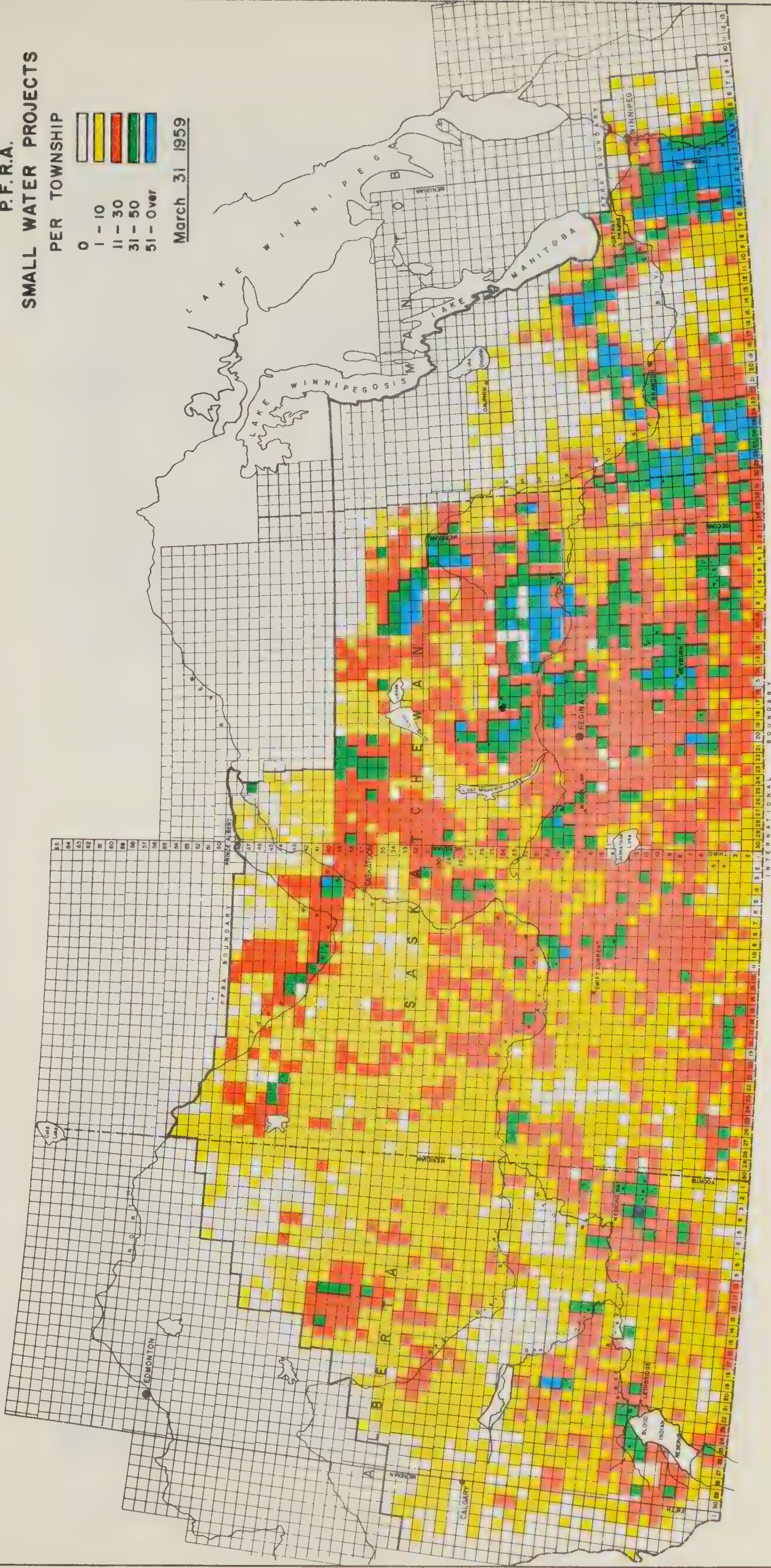
# P.F.R.A.

## SMALL WATER PROJECTS

PER TOWNSHIP



March 31 1959









A farm dam in southwestern Saskatchewan which provides water for stockwatering and domestic use.

Ref. No. 11732



A stockwatering dam on rangeland in southwestern Alberta.

Ref. No. 16681

## Community Projects

When water conservation projects large enough to serve a number of farmers or a rural community are built, P.F.R.A. supplies all engineering services and contributes a greater proportion to the cost of construction. These projects are usually located on the more well defined watersheds and provide a means of storing larger quantities of water for use throughout the area, particularly during dry periods.



A community dam and reservoir at Castor in central Alberta, used for stockwatering and also as a domestic water supply for the community.

Ref. No. 5797

Construction was authorized on 54 new community projects during 1958-59, with construction being advanced or improvements being carried out on 12 community projects authorized in previous years. To the end of March 1959, over 400 "community projects" had been constructed under P.F.R.A. supervision. A complete list of the "community projects" under construction in 1958 may be found in Appendix III showing the type, location, size and cost.

## Large Water Development Projects

The construction of large water conservation projects, usually located on the main watersheds in the P.F.R.A. area, is undertaken by the





LARGE WATER DEVELOPMENT PROJECTS

1935 - March 31, 1959

<u>Name of Project</u>	<u>Location</u>	<u>Prov.</u>	<u>Type of Project</u>
1. Adair Creek Dam	Wolseley	Sask.	Multi-Purpose Res.
2. Adams Lake	Battle Creek	Sask.	Irrigation
3. Aetna Irrig. District	Aetna	Alta.	Irrigation
4. Atlee Gas Well #1	Atlee	Alta.	Irrig. (pump)
5. Atlee Gas Well #2	Atlee	Alta.	Irrig. (pump)
6. Bartman Dam	Cessford	Alta.	Irrig.- St'watering
7. Battleford	North Battleford	Sask.	Irrig. (pump)
8. Bedford Slough	Medicine Hat	Alta.	Irrigation
9. Big Arm Storage	Arena	Sask.	Irrig.- St'watering
10. Boissevain Dam	Boissevain	Man.	Storage
11. Brown Hill Dam	Grenfell	Sask.	Storage
12. Buffalo Pound Lake	Qu'Appelle Valley	Sask.	Irrig.- St'watering
13. Bullshead Creek	Medicine Hat	Alta.	Irrig.- St'watering
#14. Canada Land and Irrig- ation Co.	Medicine Hat	Alta.	Irrigation
15. Canora	Canora	Sask.	Storage
16. Caron	Caron	Sask.	Flood Control
17. Caron Water Development	Thunder Creek	Sask.	Storage-St'watering
18. Consul-Vidora	Vidora	Sask.	Irrigation
19. Craven Dam	Qu'Appelle Valley	Sask.	Irrig.- St'watering
20. Crooked & Round Lakes	Qu'Appelle Valley	Sask.	Irrig.- St'watering
21. Cypress Storage Reservoir	Ravenscrag	Sask.	Storage for Irrig.
22. Davidson Dam	Davidson	Sask.	Irrig.- St'watering
23. Deadfish Creek	Cessford	Alta.	Irrigation
24. Dead Lake	Macoun	Sask.	Irrig.- St'watering
25. Dunn & Watt	Mankota	Sask.	Irrigation
26. Eastend Dam	Eastend	Sask.	Irrigation
27. Eastern Irrig. District	Brooks	Alta.	Irrigation
28. Echo Lake	Qu'Appelle Valley	Sask.	Irrig.- St'watering
29. Eureka Irrig. Project	Grassy Lake	Alta.	Irrigation
30. Fairy Hill	Qu'Appelle Valley	Sask.	Irrig.- St'watering
31. Graham Creek	Calgary	Alta.	Stockwatering
32. Gouverneur Dam	Ponteix	Sask.	Irrigation
33. Hugonard Dam	Lebret	Sask.	Multi-Purpose Res.
34. Kaposvar #2	Melville	Sask.	Stockwatering
35. Katepwa Weir	Katepwa	Sask.	Irrig. & Storage
36. Killarney Dam	Killarney	Man.	Multi-Purpose Res.
37. Kisbey Flats	Kisbey	Sask.	Irrigation
38. Lafleche Dam	Lafleche	Sask.	Irrigation
39. Lake of the Rivers	Assinibioia	Sask.	Stockwatering
40. Lajord	Lajord	Sask.	Flood Control
41. Larson Dam	Radville	Sask.	Stockwatering
42. LaSalle River Dams (2)	LaSalle	Man.	Stockwatering

<u>Name of Project</u>	<u>Location</u>	<u>Prov.</u>	<u>Type of Project</u>
43. Last Mountain Lake	Qu'Appelle Valley	Sask.	Irrig.- St'watering
#44. Leavitt Irrigation	Mountain View	Alta.	Irrigation
45. Lebret	Qu'Appelle Valley	Sask.	Irrig.- St'watering
46. Little Manitou (Lanigan Creek)	Watrous	Sask.	Control Structure
47. Long Creek No. 1	Estevan	Sask.	Stockwatering
48. Long Creek No. 2	Estevan	Sask.	Stockwatering
49. McCraney, R.M. of	Kenaston	Sask.	Stockwatering
#50. Magrath	Magrath	Alta.	Irrigation
51. Maple Creek	Maple Creek	Sask.	Irrigation
52. Mary Jane Creek Storage	Manitou	Man.	Storage
53. Middle Creek	Battle Creek	Sask.	Irrigation
54. Minnedosa Dam	Minnedosa	Man.	Storage
55. Moose Jaw Creek	Lang	Sask.	Irrigation
56. Moose Mountain	Corning	Sask.	Irrigation
57. Morden Dam	Morden	Man.	Irrig.- St'watering
58. Mountain View	Mountain View	Alta.	Storage
59. Oak Lake	Oak Lake	Man.	Irrigation
60. Oxbow Dam	Oxbow	Sask.	Irrig.- St'watering
61. Pipestone Creek	Broadview	Sask.	Stockwatering
#62. Raymond	Raymond	Alta.	Irrigation
63. Richardson-McKinnon	Consul	Sask.	Irrigation
64. Rock Lake Reservoir	Brooks	Alta.	Storage
#65. Rolling Hills	Rolling Hills	Alta.	Irrigation
66. Roughbark Creek	Goodwater	Sask.	Stockwatering
67. Roseau River Dam	Dominion City	Man.	Storage-St'watering
68. Rosthern Water Storage	Rosthern	Sask.	Storage
69. Russell Creek Dam	Pambrun	Sask.	Irrigation
70. St. Malo Dam	St. Malo	Man.	Storage
71. Saskatoon Weir	Saskatoon	Sask.	Storage
72. Seven Persons	Seven Persons	Alta.	Stockwatering
73. Souris-Estevan	Estevan	Sask.	Irrig.- St'watering
74. Souris River	Weyburn	Sask.	Flood Control
75. Swift Current	Swift Current	Sask.	Irrigation
76. Tantallon	Tantallon	Sask.	Stockwatering
77. Thunder Creek	Kettlehut	Sask.	Flood Irrigation
78. Town of Souris	Souris	Man.	Stockwatering
79. Val Marie Dam	Val Marie	Sask.	Irrigation
80. Val Marie (West) Dam	Val Marie	Sask.	Irrigation
81. Valeport Dyke	Valeport	Sask.	Flood Irrigation
82. Wawanesa Dam	Wawanesa	Man.	Irrig.- St'watering
83. Weyburn Dam	Weyburn	Sask.	Flood Irrigation
84. Wildhorse Storage	Cressday	Alta.	Irrigation
85. Wood River Development	Coderre & Gravelbourg	Sask.	Stockwatering

# - P.F.R.A. gave assistance to a project already in existence to improve storage capacities, canals and distribution systems.



Federal Government to provide one or a combination of the following services; stockwatering, irrigation, water storage, flood control, and reclamation. These projects are built under an agreement with the provincial or local government concerned, whereby P. F. R. A. pays the cost of construction, with the responsibility for operation, maintenance, and development, being assumed by the provincial or local government one year after completion of the project. To March 31, 1959, P. F. R. A. had constructed 85 large water development projects.

During the year construction was completed on five large water development projects, two of which were started in the previous year. Construction began on one additional large water development project in 1958 which is expected to be completed early in the 1959 construction season. Following is an outline of the large water development projects under construction during 1958-59.

#### Brown Hill Project

Construction of the Brown Hill project which began in 1957, was completed during 1958. This water conservation project will provide a more reliable water supply for domestic use and stockwatering in the Grenfell district of southeastern Saskatchewan. The Brown Hill dam is located 1 1/2 miles southwest of Grenfell on the headwaters of a small tributary of the Qu'Appelle River. Although this coulee has a drainage area above the dam of only 4 square miles, the water supply for the reservoir which has a capacity of 285 acre feet, is assured by diverting water from the Pipestone Creek through a control structure and canal into the Brown Hill reservoir. The dam is of earth-fill construction with a concrete chute spillway for normal flows and an emergency earth cut spillway to pass peak flood flows.

#### Valeport Dyke

The Valeport Dyke, constructed in the early 1940s was breached in 1948 to relieve flooding conditions at Lumsden. As a result, the 1,500 acres of hay land south of the dyke were flooded almost continuously. To protect this hay land as well as the market gardens below Last Mountain Lake from flooding, required the construction of a control structure and dyke across Last Mountain Creek Valley, south of Valeport. This work which was begun in 1957 and completed in 1958, will control the flow between Last Mountain Lake and the Qu'Appelle River.

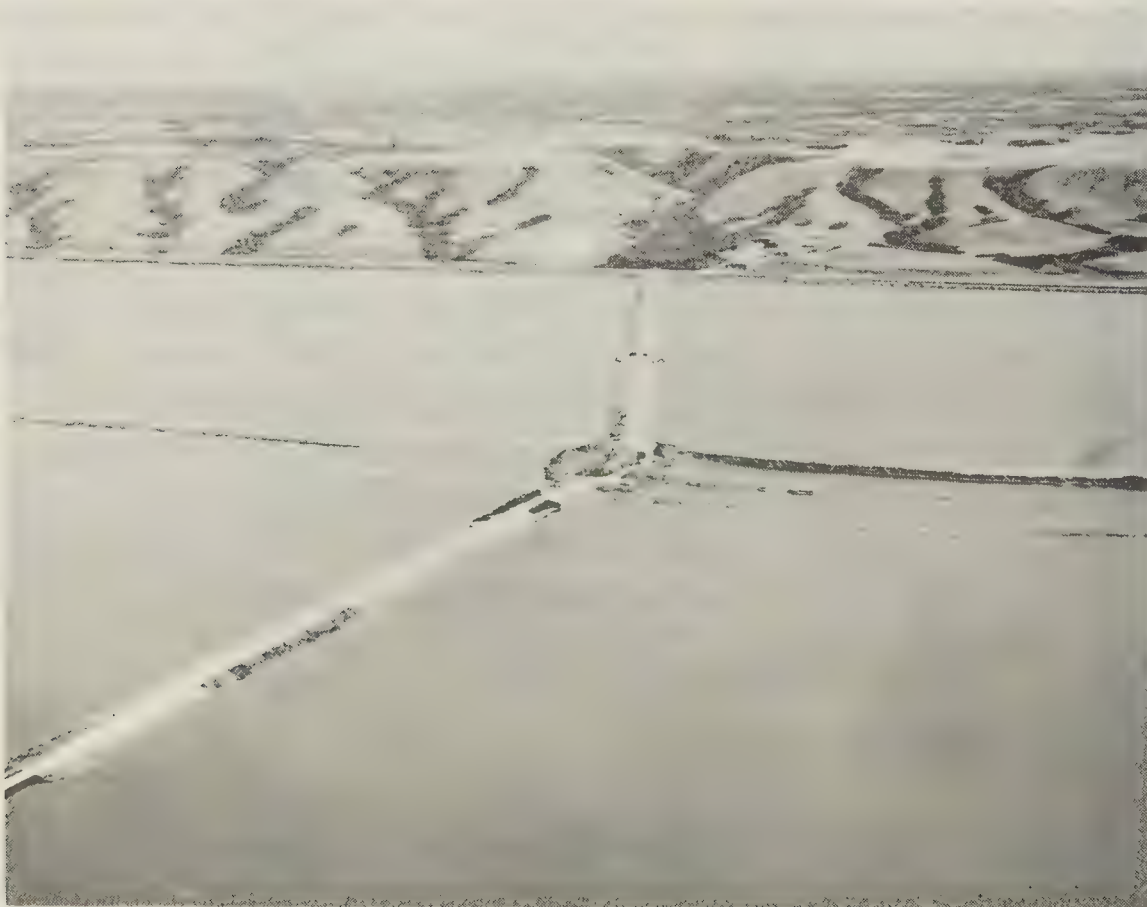
#### Rosthern Water Storage Project

The Rosthern Water Storage Project, located adjacent to the town of Rosthern in north-central Saskatchewan, will provide storage for about 140 acre feet of water. Because of the flat terrain in the surrounding areas, it was necessary to construct a combination dugout and dam in order to ob-



Downstream slope of Brownhill Dam south of the town of Grenfell in southeastern Saskatchewan, showing concrete chute spillway in the upper lefthand corner.

Ref. No. 16859



Valeport dyke from east bank with main control structure under construction at the bend in the dyke.

Ref. No. 15482



tain sufficient storage capacity. An earth overflow section is incorporated in the dam to take care of surplus flows. The slopes of the overflow section are to be seeded to grass in 1959. In an area where there is no other satisfactory water supply, it is estimated that some 1,300 people will benefit directly by this project as it will provide water for domestic use in the community of Rosthern and for farm use in the surrounding district.

#### St. Malo Storage Project

The St. Malo Project is located on the Rat River in southern Manitoba one mile from the village of St. Malo and some 35 miles south of Winnipeg. The dam will help regulate the flow of the Rat River and provide a water supply for domestic, municipal, and stockwatering purposes. The project, which has a storage capacity of 1,770 acre feet of water, involved the construction of an earth fill dam 620 feet long and 40 feet high with a concrete chute spillway capable of passing 6,000 c.f. s. At full supply level the St. Malo reservoir will be about 1 1/2 miles long and 1/4 mile in width.

#### Sunbeam Creek Project

A reservoir located on Sunbeam Creek within the Forest Nursery Station south of Indian Head, Saskatchewan, supplies water for irrigation required on the Station. The spillway associated with the reservoir was in a deteriorated condition and needed to be replaced in order to assure an adequate water supply. A new concrete drop inlet spillway with a 66" corrugated culvert was installed during the latter part of 1958. To further improve this project, the upstream slope of the dam was faced with gravel and rock rip-rap. This project was constructed under P.F.R.A. supervision for the Indian Head Forest Nursery Station.

#### Mary Jane Creek Storage Project

Construction of a water storage project on Mary Jane Creek, a tributary of the Pembina River, began in the fall of 1958. Located six miles northwest of the Town of Manitou in southern Manitoba, the Mary Jane Project will store 1,150 acre feet of water and provide an assured water supply of 275 acre feet for agricultural and municipal purposes. In an area where a reliable source of water has always been a problem, as most of the stream courses dry up during the summer and groundwater supplies are difficult to obtain, this project, which will provide water to maintain the downstream flow, will also provide a reliable supply of water for domestic use in the surrounding rural communities.

The dam will be of earth-fill, 520 feet long and 45 feet in height. A natural spillway operating in conjunction with a concrete drop inlet structure will provide the necessary controls to pass flood flows and fill riparian requirements. It is expected the project will be completed early in the 1959 construction season.



Drop inlet spillway under construction on the Sunbeam Creek Project at the Forest Nursery Station near Indian Head, Saskatchewan.

Ref. No. 16586



Completed drop inlet spillway with timber trash rack at the Forest Nursery Station near Indian Head in southeastern Saskatchewan.

Ref. No. 17276



### Technical Assistance

In addition to financial assistance referred to in the previous sections the following free field services were provided by the Water Development Branch in 1958-59:-

	Agricultural Services	Engineering Services
--	-----------------------	----------------------

#### Dugouts

Preliminary calls	1,768
Final inspections	3,330
Miscellaneous inspections	537

#### Stockwatering Dams

Preliminary calls	321	
Final Inspections	102	268
Miscellaneous inspections	218	881
Surveys completed		591
Plans prepared		427

#### Irrigation

Preliminary calls	293	
Final inspections	53	125
Miscellaneous inspections	283	941
Surveys completed		282
Plans prepared		187

#### Community Projects

Preliminary calls	209	
Final inspections	76	
Miscellaneous inspections	309	
Projects investigated		216
Projects built		46
Surveys and plans prepared		74
Maintenance		77

Sub Totals

7,499

4,115

TOTAL

11,614

### Special Services

During the year a number of special projects received the attention of the Water Development Branch. To provide protection for earth fills and canals, several hundred pounds of grass seed were distributed in areas where new construction had taken place. Complementing this program was the planting of some 22,000 cuttings and seedlings in tree belts for the protection of reservoirs and the establishing of snow traps.

The investigation of Evaporation Control on farm ponds in southern Alberta was continued in co-operation with the Experimental Farm Service. Continued contact and liaison was maintained with Ionics Incorporated Ltd., of U.S.A., manufacturers of electric membrane demineralizers. Work is being continued by this company on a demineralizer unit to serve individual or small community requirements.



## COMMUNITY PASTURE PROGRAM

The Community Pasture Branch was set up following an amendment to the Prairie Farm Rehabilitation Act in 1937 which made provision for a land utilization and resettlement program. The establishing of community pastures in Manitoba and Saskatchewan has had a far reaching effect on agricultural production in Western Canada.

Large acreages of submarginal land proven unsuitable for cereal crop production are leased to the Federal Government to be developed into pasture areas. Families located within the proposed pastures are given assistance to move to better land within the same or a neighboring municipality where they are in a position to take advantage of the pasture facilities. If land is not available in these areas, farm families are assisted in moving to irrigation projects built by P.F.R.A. for resettlement purposes.

Since the inception of the Community Pasture program in 1937, a total of 1,815,265 acres of land has been developed for pasture use. This acreage includes the Mount Hope-Prairie Rose pasture north of Semans in central Saskatchewan, which was put into operation in 1958, and the Cote-San Clara pasture on the Manitoba-Saskatchewan border north of Togo, which was established in 1958 and will be put into operation in 1959. A total of 62 pasture projects were in operation in 1958. These pastures handled the equivalent of 117,032 head of cattle, a decrease from the previous year of 2,366 head. This small decrease is attributed to the prevailing pasture conditions in some areas following two comparatively dry years. The stock handled during 1958 was owned by 5,835 patrons as compared to 5,763 in 1957. Detailed statistics of the community pasture program from 1937 to 1958 will be found in Appendices V and VI of this report.

### Pasture Operations

As a result of two consecutive dry years, all pastures in Saskatchewan except the Royal and Beaver Hills Pastures were stocked to capacity. A number of farmers from outside the Royal and Beaver Hills Municipalities who were in need of pasturage took advantage of this available grazing by trucking their cattle to these pastures.

The grazing season in community pastures extended from the last week in April to the end of October. In the Val Marie and Bitter Lake pastures special arrangements have been made to winter graze a limited number of cattle at regular grazing fee rates. Despite experiencing the



Coalfield's Community Pasture headquarters located in southeastern Saskatchewan.

Ref. No. 17933

driest season for several years, the stock, in most cases when taken from the pastures, were in exceptionally good condition. The pastures as a whole held up remarkably well under the very adverse conditions. The grass carry-over in some of the pastures was below normal and a good many dams and dugouts were practically dry by fall. Additional water storage facilities were installed during the year to take full advantage of spring runoff. As a result of the attractive prices, and the fact that harvest operations were completed earlier than usual, making stubble fields available for fall grazing, large numbers of cattle were taken out of Community Pastures in September.



# COMMUNITY PASTURES PRAIRIE FARM REHABILITATION ACT MARCH 31 - 1959

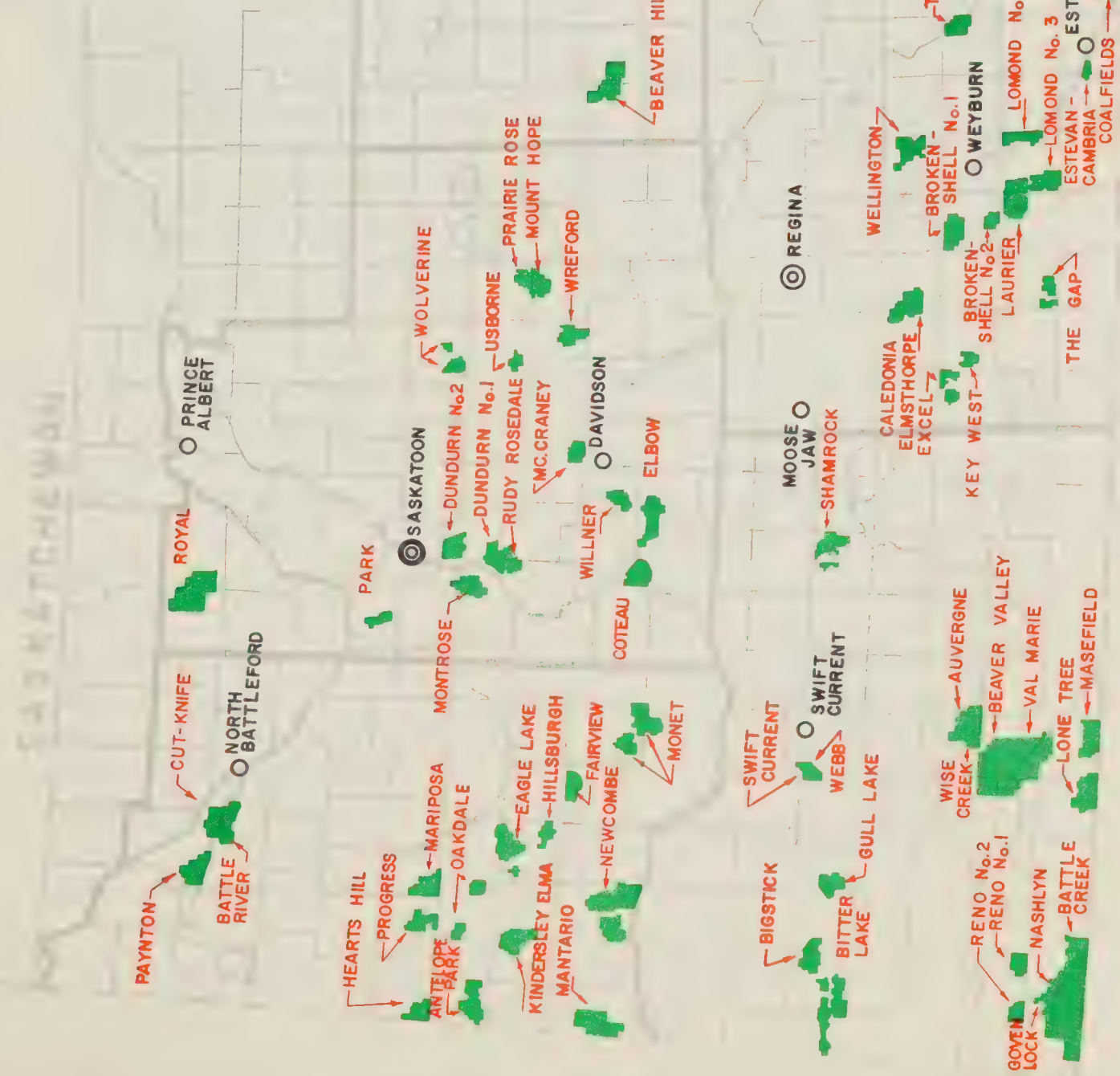
AREA ENCLOSED IN 62 PASTURE UNITS

SASKATCHEWAN	1,647,685	ACRES
MANITOBA	164,300	ACRES
TOTAL	1,811,985	ACRES

COMPLETED

UNDER DEVELOPMENT

PASTURE SUPERVISORS' AREA







In the early part of the season, grasshoppers presented a very serious problem. Aerial and ground spraying operations were successfully carried out in seven pastures in an effort to control this menace to the pastures as well as to crops in the surrounding areas.

### Pasturage

The allocation of pasture privileges is handled by the Advisory Committee for each pasture, in accordance with the established policy and on the basis of need. The Committee also sets the maximum number of stock per patron, keeping in mind the carrying capacity which will promote good pasture management.

### Fees

A new schedule of P.F.R.A. community pasture rates came into effect on August 1, 1958. The main change was from a monthly to a daily rate on cattle and horses. Following is the present rate schedule for pasture services:

#### Grazing Rates

Cattle per day per head	.03
Horses per day per head	.04
Sheep per month per head	.10 (provide own herder)
Cows (breeding service)	3.00 per head
Colts of current year, sucking with dam, born before August 1.	4.00 per head
Calves of current year, sucking with dam, born before August 1.	3.00 per head

No charge will be levied on colts and calves born in pasture after July 31 of current year to end of summer season. A minimum grazing charge of \$4.00 per head for horses, \$3.00 per head for cattle, and 30 cents per head for sheep, will be levied against any of these animals recorded for pasturage.

#### Rates for Vaccine and Other Services

Vaccines	.15 per single dose
Dehorning	.50 per head
Warble and Horn Fly Spraying	.15 per head
Mineral Supplement	.35 per head
Castration: Cattle under 6 mos.	1.00 per head
Cattle 6 mos. & over	2.00 per head
Encephalomyelitis & Special Vaccines	At cost

## Breeding Service

A sufficient number of pure bred bulls to provide adequate breeding services in community pastures are supplied by P.F.R.A. as requested by pasture patrons. An annual rental of \$40.00 is charged for each bull supplied to a pasture. The breed of bulls used is determined by a majority vote of the patrons. At the end of January 1959, P.F.R.A. had 811 bulls, of which 730 were Hereford, 68 Shorthorn, and 13 Aberdeen Angus.



Hereford bulls of the type made available for use in Community Pastures under the P.F.R.A. breeding service program.

Ref. No. 15782

In 1958 there were 1,025 bulls used in the breeding service, 802 of these bulls having been supplied by P.F.R.A. and 223 were rented from pasture patrons. An estimate 90% calf crop resulted from the 31,977 cows serviced. P.F.R.A. purchased 21 mature and 90 yearling bulls in 1958. The yearling bulls are being developed at the Archie and Bitter Lake Pastures along with the bull calves purchased in 1957. One hundred and seventy-nine bulls unfit for further breeding service were sold for slaughter and 27 bulls died from various causes during the year.

## Diseases and Special Services

No serious outbreaks of disease affected the livestock in P.F.R.A. community pastures in 1958. As compared to former years, there was



very little pink eye or foot rot. All cattle affected by warbles were treated upon entering the pastures. An effective program for the control of external parasites such as horn flies, mosquitoes, lice and ticks was carried on by spraying and the use of treated back scratchers. Other services required in good livestock management are provided by the pasture management when they are required.

### Livestock Insurance

To offset losses by death, which are inevitable in livestock production, livestock insurance is carried in most community pastures. The total livestock losses from all causes in 1958-59 were 554 cattle and 6 horses which amounts to less than 1/2 of 1 % of the livestock handled.

### Hay and Grass Seed

A total of 4,683 tons of hay and green feed to be used for feeding the pasture bulls and headquarters stock was harvested on P.F.R.A. community pastures by pasture managers during the year. A small percentage of this hay was put up by neighboring farmers on a share basis. Owing to the dry season no grass seed was harvested in 1958.

### Regrassing

During the 1958 season, 1,870 acres were seeded to grass in 9 of the community pastures. This included 460 acres of crested wheat grass, 1,015 acres of brome grass, and 395 acres of mixed grasses.

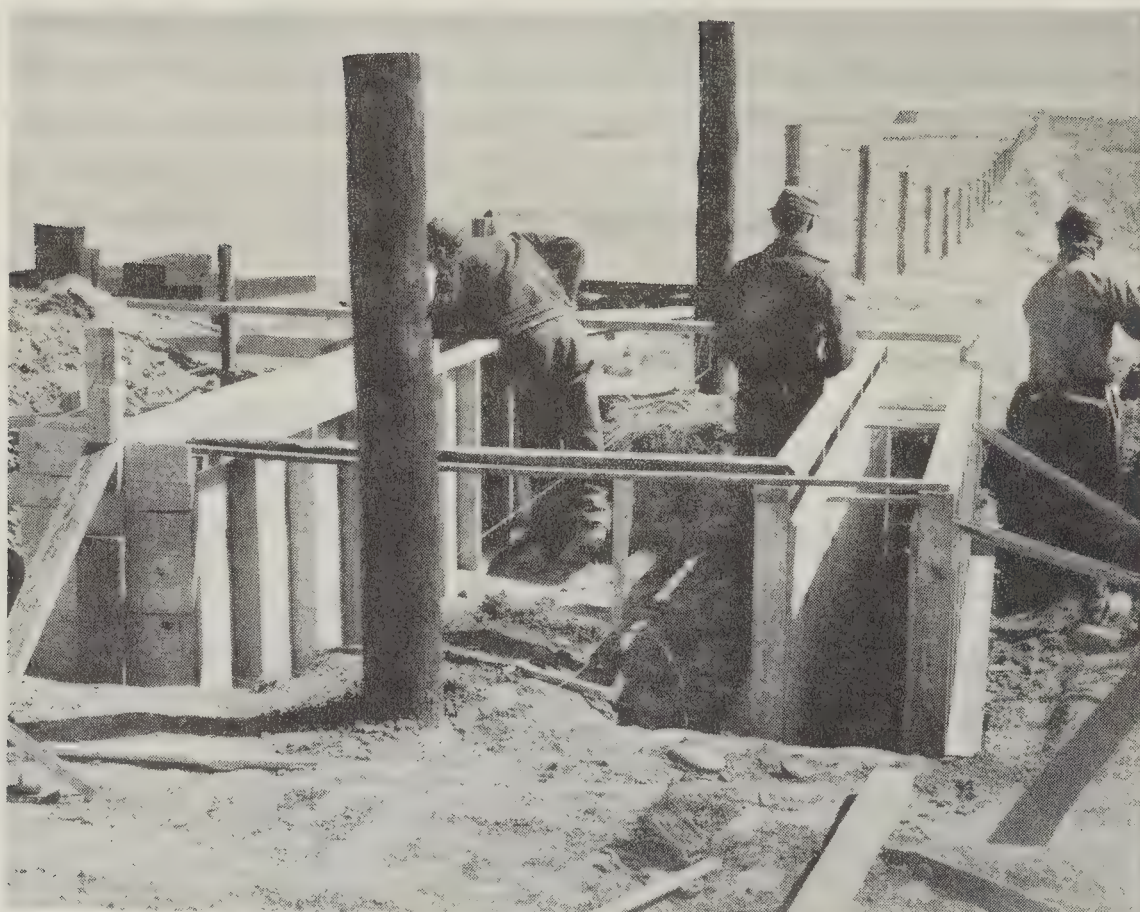
### Fire and Fire Protection

No buildings were destroyed by fire during the year 1958-59. Approved type fire extinguishers are maintained in all buildings for immediate use.

Several small grass fires, usually caused by lightning, occurred in the pastures. Fireguards are maintained in prairie pastures by two motorized graders. In 1958, the graders maintained 722 miles of established fireguard. In addition, several miles were maintained by contract and by pasture managers using pasture equipment.

### Pasture Construction

To maintain and extend pasture facilities, eight construction crews were employed by P.F.R.A. in 1958-59. Besides the work in the operating pastures, construction on the 18,240 acre Cote-San Clara Pasture was completed and construction was advanced on the 72,320 acre McCreary Pasture in Manitoba. In addition, two water development crews carried out an extensive maintenance program on domestic and stockwatering facilities located in the various P.F.R.A. community pastures.



Pasture gate construction on the Val Marie Community Pasture in southwestern Saskatchewan.

Ref. No. 10825

Following is a summary of the Pasture Construction Activities for the 1958-59 season:

Particulars	Projects Completed in 1958	Repair Work Completed in 1958	Total to March 31, 1959
Fencing	99 1/4	162	4,331
Corrals	1	7	161
Pasture Managers' Dwellings	4		56
Riders' Cabins	3		36
Barns	1		57
Garages	2		57
Bull Sheds	4	1	49
Others (Granaries, Oil Sheds, Chicken House, Pump Houses)	6		164



Water Development	Projects Completed in 1958	Repair Work Completed in 1958	Total to March 31, 1959
Windmills	26	8	371
Wells	23		312
Springs	7		167
Dams	17		250
Dugouts	25	18	606

Total number of acres enclosed as at March 31, 1958 - 1,792,995 (X)

Total number of acres enclosed 1958 construction season - 18,990

Total number of acres enclosed as at March 31, 1959 - 1,811,985

(X) Acreage of the Wallace Pasture, originally fenced by P.F.R.A., now operated by the Province of Manitoba, has been deleted from the former 1957-58 figure.



A fenced dugout on the Willner Community Pasture in central Saskatchewan.





A flowing well discovered on the new Mount Hope-Prairie  
Rose Community Pasture in central Sask.

Ref. No. 17541

### P a s t u r e   I m p r o v e m e n t

Originally submarginal land turned over to P.F.R.A. to be developed into community pastures consisted of abandoned cultivated farm land or overgrazed rangeland both usually being subject to weed growth and soil drifting. In more recent years requests have been received for the development of community pastures on submarginal parkland in the northern and eastern part of the P.F.R.A. area.

In the developing of a community pasture, P.F.R.A. encloses the proposed area with a fence, regrassess abandoned cultivated land and overgrazed areas, establishes stockwatering facilities such as dams, dug-outs, wells and springs, and constructs a pasture headquarters and corrals. Once in operation, grazing and management policies are followed in all P.F.R.A. community pastures which will ensure the future productivity and efficient utilization of the various areas and characteristics of each pasture.

Crested Wheat Grass has been used extensively for regrassing purposes because of its drouth tolerance and suitability for spring grazing. This latter features makes it ideally suited for use in rotation with native



grasses. Adequate cross fencing is required in order that the livestock can be confined to the Crested Wheat Grass areas until the middle of June after which date the native grasses produce their heaviest yield providing they have been protected earlier in the season.

To encourage even grazing, special care is taken in locating stockwatering sites, salt supplies, and backscratchers as these are major factors in influencing the distribution of cattle throughout the pasture area. Stockwatering sites are located as nearly as possible within two miles of each other on open range and preferably closer in rough terrain or in bush country. Cattle travelling greater distances do not graze the pasture evenly nor do they make normal gains in weight. The salt supplies and backscratchers are located away from the watering sites to encourage the cattle to move away from those areas.

An important factor in preventing overgrazing and in maintaining the pasture grass in a healthy and vigorous condition in P.F.R.A. community pastures, is the policy of maintaining a 50 per cent grass carry-over, wherever it is possible and feasible. This policy also helps stabilize available pasturage during dry periods.

To keep up to date with advances in range management, P.F.R.A. has established a special Pasture Improvement section under the supervision of the Community Pasture Branch. This section plans and carries out an investigational and work program designed, through the application of agricultural and engineering principles, to further increase the carrying capacity and to improve the drouth resistance of grass land in community pastures. This program, which has now extended into 44 pastures, is being developed in close co-operation with the Experimental Farms Service which advises on new methods and procedures and carries out a program of production measurements to determine the effectiveness of the various pasture improvement operations.

In community pastures on the open plains where moisture is the limiting factor in grass production, the Pasture Improvement section is primarily interested in water conservation. The program for these pastures includes a full investigation and development of stockwatering facilities, a study of mechanical soil treatments and the planning and establishing of flood irrigation schemes. In addition, an extensive grass survey was completed in 1958 on eight prairie pastures in southwestern Saskatchewan, on the basis of which comprehensive recommendations were submitted for a systematic fencing and regrassing program to provide more efficient utilization of these pastures.

During the year, 19 dams and 6 dugouts were constructed under the supervision of the Pasture Improvement section. Studies were continued on areas that received previous mechanical treatments such as contour furrows, and surface pitting. Four hundred acres of deep pitting was carried



out in the Masefield and Govenlock Pastures in 1958 to check the effectiveness of this operation. Development work was continued on the 4,000 acres of pasture land in eight flood irrigation schemes located in the pastures of south western Saskatchewan.

The main problem facing the Pasture Improvement section in the community pastures which are located in the northern and eastern portion of park region of the P.F.R.A. area is one of land clearing rather than water conservation. Community pastures in the park area usually contain rough, stoney, or sandy land not suitable for cultivation. When these areas, which are covered by trees and bush interspersed by patches of grass, are protected from grass fires, the bush condition soon invades the whole area. The Pasture Improvement section has used various methods to clear established tree growth in Community Pastures. The most efficient operation has proven to be the use of the ball and chain. During 1958-59 over 1,600 acres



Land clearing operations by the chaining method in the Beaver Hills community pasture in southeastern Saskatchewan.

Ref. No. 16911

were cleared by this method. Rotary cutters were used to clear 600 acres of small trees and bush not over 3 1/2" in stem diameter. When proper conditions prevail, controlled burning has proven a cheap and effective method of controlling bush invasion and regrowth on cleared areas. The extent to which controlled burning is possible has been greatly increased by the use of a Stump Jump plow imported from Australia to establish fireguards through-





Fireguarding by the use of the new Stump Jump plow through bush land in the Woodlands Community Pasture in Manitoba.

Ref. No. 15743

out the park area. During the year over 100 miles of fireguards were established by this machine. In addition to mechanical clearing and burning, herbicidal spraying was used on 152 acres in the Beaver Hills pasture to control regrowth. Other work supervised by the Pasture Improvement section in the parkland community pastures during 1958 included the regrassing of 290 acres, the repair of 2 stockwatering dams, the construction of 9 miles of access road, and the completion of construction work on drainage projects involving 1,950 acres in the Beaver Hills Community Pasture.

## REHABILITATION and RESETTLEMENT

Following the severe drouth and depression of the early 1930s many farm families in Western Canada became dependent upon Government and public relief programs for survival. The rehabilitation and resettlement program developed under the Prairie Farm Rehabilitation Act and its 1937 amendment, has been an important factor in re-establishing the farming population in the drough area of the Canadian Prairies.

One of the first steps in the rehabilitation program was to help farmers overcome the immediate problem of farm water supply, by providing financial and engineering assistance in the construction of small dams and dugouts. In this way farmers were able to rehabilitate themselves without the necessity of moving to a new location. To further assist in the rehabilitation program the Government of Canada constructed community irrigation projects in some of the driest areas of south western Saskatchewan. The irrigated land associated with these projects is divided into 40 acre plots and leased to farmers for the production of feed and seed supplies. By providing an assured feed supply, even when drouth conditions prevail, these projects have helped stabilize the agricultural economy of the areas in which they are located.

Where it has not been possible to effect the rehabilitation of farmers on the land they are operating by helping them obtain an adequate farm water supply, or in those areas in southwestern Saskatchewan where community irrigation projects have been developed, by providing irrigated land for the production of a supplementary feed supply, special arrangements have been established whereby farmers may receive assistance in moving to irrigated land in Alberta which has been developed by the Federal Government for resettlement purposes. Following is an account of the progress and development on the irrigation projects constructed in Saskatchewan and Alberta for the rehabilitation and resettlement of farmers throughout the P.F.R.A. area.

### Val Marie Irrigation Project

Located on the Frenchman River near the town of Val Marie in southwestern Saskatchewan, the Val Marie Irrigation Project was one of the first irrigation projects built for rehabilitation and resettlement purposes. Water for irrigation on this project is obtained from runoff on the southern slopes of the Cypress Hills. This water is stored in the Cypress Storage Reservoir which is located well up in the Cypress Hills at the headwaters of the Frenchman River. A dam on the Frenchman River near Val Marie provides local storage for the irrigation water used on this project.

The Val Marie Irrigation Project now has a total irrigable area of 4,635 acres. In 1958, four thousand three hundred and five acres were



irrigated by 70 plot holders with the remaining 330 acres being summerfallowed and levelled. As the natural precipitation during the growing season was only 2.75 inches, a third irrigation was necessary on 1,420 acres of alfalfa hay mixtures that were irrigated early in the season. A total of 6,500 acre feet of water was used for irrigation.

Forage production on the Val Marie Project has increased steadily from an average of one ton per acre in 1954 to 1.8 tons in 1958, resulting in a total production of 7,000 tons of forage crops. This was sufficient to maintain 5,800 cattle which make up the breeding herds of the farmers using the project.

An open winter was experienced up to the end of December 1958 in the Val Marie area and as there had been a considerable carryover of feed from 1957, many plot holders sold supplies of hay to livestock producers in the district whose dry land hay crops had failed as a result of the very dry growing season.

A heavy program of maintenance work to bring the project into good operating condition was carried out during the season. This necessitated the renewing of several large checks and drop structures, and the replacing of several bridges on the main canal which had been in operation for over 20 years. To improve the water supply on the project the live storage in the Val Marie Reservoir was increased by 2,000 acre feet in 1958. The total capacity of the reservoir is now 12,000 acre feet.



General view of the irrigated area on the West Val Marie Irrigation Project.

## West Val Marie Irrigation Project

The West Val Marie Irrigation Project is located on the Frenchman River, west of Val Marie. Irrigation water is obtained from the Cypress Storage Reservoir with local storage being supplied by the West Val Marie dam. The West Val Marie project has a potential irrigable area of 3,500 acres. In 1958 two thousand two hundred and sixty acres were under forage crop production with an additional 400 acres being developed for irrigation in 1959. As a result of the low summer precipitation, 820 acres of early irrigated hay stands required three irrigations. Approximately 4,900 acre feet of water were used during the irrigation season to produce some 4,800 tons of feed averaging 2.2 tons per acre. This was sufficient to supply the winter feed requirements of the 3,500 head of cattle owned by the plot holders.

In addition to regular maintenance work, approximately 350 acres of land along the fringes of the river were scraper levelled using the Parkinson Grid method. This area will be in production and available to settlers in 1959. Two permanent electrically operated pumps powered by one 7 1/2 H.P. and one 10 H.P. motor were installed on the river below the West Val Marie Reservoir to replace the tractor driven pump which has operated for the past six years. These pumps will supply water to 300 acres of irrigable land across the river from the gravity system. During the year surveys were carried out to determine the feasibility of developing a further 850 acres of land on this project.

A contract was let in the late fall of 1958 to replace the spillway of the West Val Marie Reservoir. This improvement to be undertaken in 1959, will increase the Reservoir capacity from 2,000 to 4,800 acre feet of water.

## Eastend Irrigation Project

The Eastend Irrigation Project is situated in the Frenchman River Valley about 50 miles upstream from Val Marie, and extends for fifteen miles southeast of the town of Eastend. Irrigation water for this area is supplied from the Eastend Reservoir and in dry periods the supply is supplemented from the Cypress Storage Reservoir in the Cypress Hills. Of the 3,320 acres of potentially irrigable land on the Eastend project, 2,390 acres were operated by 42 plot holders in 1958, with 2,230 acres being used to produce forage crops.

As there was only 3.69 inches of natural precipitation during the growing season, an early irrigation was necessary on all land in forage crop production. On the 1,740 acres where alfalfa was predominant in the hay mixture, a second irrigation was also required. Approximately 4,000 acre



feet of water was used on the Eastend project in 1958. Even though 44 per cent of the second crop was left standing and used for fall grazing, 3,300 tons of feed were produced. This amount was sufficient to supply the feed requirements of the 3,500 cattle and 2,000 sheep owned by the farmers using the project. With an increase of 1,150 acres in the area used to produce forage crops on the Eastend project since 1953, there has been a corresponding increase of 1,700 head in the number of cattle dependent upon the project.

Seepage from sections of the main canal has rendered small areas unproductive with an alkali-salt problem. Four thousand feet of canal were clay lined and improvements in drainage were made to reduce seepage and drainage problems on the project.

During the season, P.F.R.A. developed a new area commonly referred to as the Uglum Extension, which consists of 450 acres of new irrigable land. The canals, lateral ditches, and irrigation structures were all completed to this new area. A system of land levelling and irrigation layouts for a nine unit subdivision were also completed. It is planned to establish these plots in forage crops in 1959. A further 150 acres of privately owned land in this area can be served by this distribution system. By the development of the Uglum Extension, all of the potential irrigable land under the Eastend District can now be fully served.



Land leveling with a scraper plane on the Uglum Extension of the Eastend Irrigation Project.

## Consul Irrigation Project

Located in range land in the extreme southwestern part of Saskatchewan, south of the Cypress Hills, the Consul Irrigation Project has made it possible to provide a reliable feed supply in one of the driest areas on the Canadian Prairies. The irrigation water for this project, containing 3,570 acres of land which can be irrigated, is obtained from the Cypress Storage Reservoir through a series of canals. During the 1958 season, 2,860 acres of land were operated by 50 farmers, 520 were being developed and the remaining 170 acres which are relatively rough land of good quality, are to be developed at some future date.

Since 1952 the number of cattle owned by the farmers associated with this project has increased by some 2,600 head. This expanding live-stock population resulted not only by the increase in size of individual herds, but also as land was developed for irrigation, a reliable feed supply was made available to a larger number of farmers.

The lack of natural precipitation, which amounted to only 2.65 inches during the growing season, made an early irrigation necessary to assure good forage crop production. In 1958, two irrigations were required on 2,300 acres of the land while 560 acres received only one irrigation. A total of 5,000 acre feet of water was released to the farmers on this project. Forage production amounted to 4,660 tons, averaging just over 2 tons per acre. This was sufficient to supplement the winter feed requirements of the 3,800 cattle and 2,000 sheep owned by the farmers associated with the project.

In addition to normal repair and maintenance, P.F.R.A. crews assisted farmers in levelling 200 acres of land. During 1958-59 development was carried out on 520 acres, 315 of which will be ready for use in 1959 and the remainder will be available in 1960.

## Swift Current Irrigation Project

The irrigated land of the Swift Current Irrigation Project is located east of the city of Swift Current and is supplied with water by the Swift Current Creek which rises in the northeastern slopes of the Cypress Hills. About 14,000 acres are in the process of development at the present time in the Swift Current, Waldeck, Rush Lake and Herbert districts. The Swift Current district has an irrigable area of approximately 600 acres of mostly privately owned land. On the Experimental Farm an additional 250 acres are irrigated annually. The Waldeck and Herbert districts are operated by the Conservation and Development Branch of the provincial Department of Agriculture, but they use water supplied to them through P.F.R.A. works.



The Rush Lake Project, which is divided into two areas, North Rush Lake and South Rush Lake, is operated by P.F.R.A. on behalf of the Government of Canada.

The North Rush Lake area has 4,700 acres of developed irrigable land which is divided into 40 and 20 acre plots. On these plots, 154 farmers produced 6,750 tons of feed and 3,200 bushels of coarse grain, using about 5,660 acre feet of water. As a result of the dry season, two irrigations were required on about 40 percent of the land.

A detailed survey completed in 1957 indicated the need of improved drainage. Most of the major drainage improvements were completed in 1958 as well as field surveys for the progressive improvement of the irrigation distribution system. A legal survey of all plots, roads, and canal right-of-ways was completed during the year.

The South Rush Lake area contains 1,700 acres of low lying land which could not be developed under a regular irrigation plan. This area has been developed for a controlled spring flood system. The installation of the necessary structures for water distribution and drainage was completed this year. With partial installation of a few structures in the early spring of 1958, eight hundred acres of this area were controlled flooded.

Some 46 plot holders have annual leases on the South Rush Lake area, and they produced 1,100 tons of feed and 1,800 bushels of coarse grain. Each plot is being developed and seeded into a suitable forage mixture for this type of spring flood operation.

In 1951 the farmers in the Rush Lake area owned 7,000 head of cattle which had increased by 1958, to approximately 12,000 head. Of this number 6,000 head are owned by farmers operating plots in the Rush Lake Project. Surplus feed supplies produced under irrigation are made available to farmers in the surrounding districts.

### Maple Creek Irrigation Project

The Maple Creek Irrigation Project is located north of the Cypress Hills in the Maple Creek area of western Saskatchewan. During the past 20 years, P.F.R.A. has constructed reservoirs on the north slope of the Cypress watershed with a total storage of 26,000 ac. ft. of water. This storage supplies water to irrigate some 10,000 acres of land in the Maple Creek District, 4,800 acres of which are owned and operated by the Government of Canada. The irrigated area is comprised of the Maple Creek Flats, west of the town of Maple Creek; the Upper "V" and Lower "V" areas, 20 miles north of Maple Creek; and a large number of private flood schemes located along the various water courses flowing out of the Cypress Hills.

The Maple Creek district is a semiarid region in which chinook winds cause high evaporation. Due to moisture deficiencies and marginal soils, forage crop production through irrigation has become increasingly important as it provides an assured feed supply for the winter maintenance of a large cattle population which thrives in the Cypress Hills to the south and in the Sand Hill area north of Maple Creek during the grazing season. Forage production in 1958 totalled 14,000 tons from 6,500 acres of improved irrigable land and numerous flood meadows. This feed supplements dry land production and serves 136 farm-ranch units carrying 11,000 head of beef cattle.



Haying operations on the Maple Creek Flats showing the placement of dykes on land levelled for border irrigation on Maple Creek Irrigation Project.

Ref. No. 15920

As the watershed does not yield sufficient runoff water to warrant further expansion of the irrigable area in this district, the irrigable lands now in production are being improved so that more feed can be obtained from increased production rather than by increasing the size of the project. In co-operation with the plot holders, efforts are being concentrated on proper levelling of irrigated plots. Lands that have been levelled by the grid method are now yielding 4 1/2 tons of forage per acre. With emphasis on increased production, the Maple Creek Project is becoming an even more vital factor in bringing stability to the agricultural economy in the Maple Creek area.



During the season, sections of sandy canals were clay lined to prevent seepage from occurring and ruining the land adjacent to the canals. A drainage improvement plan was completed in 1958 for 250 acres of water-logged land caused by excess seepage from the main canal. This area showed improvement and will be utilized for pasture and some hay production. The deep pump wells on the "V" projects were in operation for six months. Their purpose is to lower the water table and reclaim lands that contain an excessive amount of alkali salts near the soil surface. Water from three of the pump wells was used for irrigation and supplemented the supply from storage reservoirs.



Pumphouse for deep well pump at Site No. 2 on the Upper "V" of Maple Creek Irrigation Project.

Ref. No. 16070

A program of maintenance was carried out on the project during the season. A new 36" outlet pipe and control tower were installed at Downie Lake Reservoir. The diversion weir for the main canal of Gap Creek was repaired by driving steel sheet piling to stabilize the structure. Several large checks, drop structures and bridges were replaced using pressure-treated material. The structures replaced had been in operation for over twenty years.

## Bow River Resettlement Project

Under the Prairie Farm Rehabilitation and Resettlement program, when there is no land available in the surrounding districts, farmers located on submarginal land in or near community pastures are given assistance in moving to irrigated farm land in Alberta. A further qualification for resettlement is that a farmer must be prepared to exchange his dry land holdings of at least 160 acres for the irrigated farm unit he acquires which contains on an average 140 acres of irrigable land. Farmers to be resettled are selected on the basis of need.

To provide irrigated land suitable for resettlement, 27,000 acres in the Hays District of the Bow River Irrigation Project were set aside in 1950 for this purpose. Since 1952 when resettlement began in this area, 189 farmers have been moved on to the project. As the irrigable land in the Hays district is now almost entirely settled, the resettlement program in this area is reaching its final stage of development. During 1958, only five Saskatchewan farm families, two from the Oscar Lake Krydor district and three from the Rosthern-Hague district, were moved to newly developed irrigated land at Hays, Alberta.



A farm house being dismantled by a settler in preparation for moving to the Hays district of the Bow River Irrigation Project.







# BOW RIVER PROJECT

RESETTLEMENT-HAYS IRRIGATION DISTRICT

MARCH 31, 1959

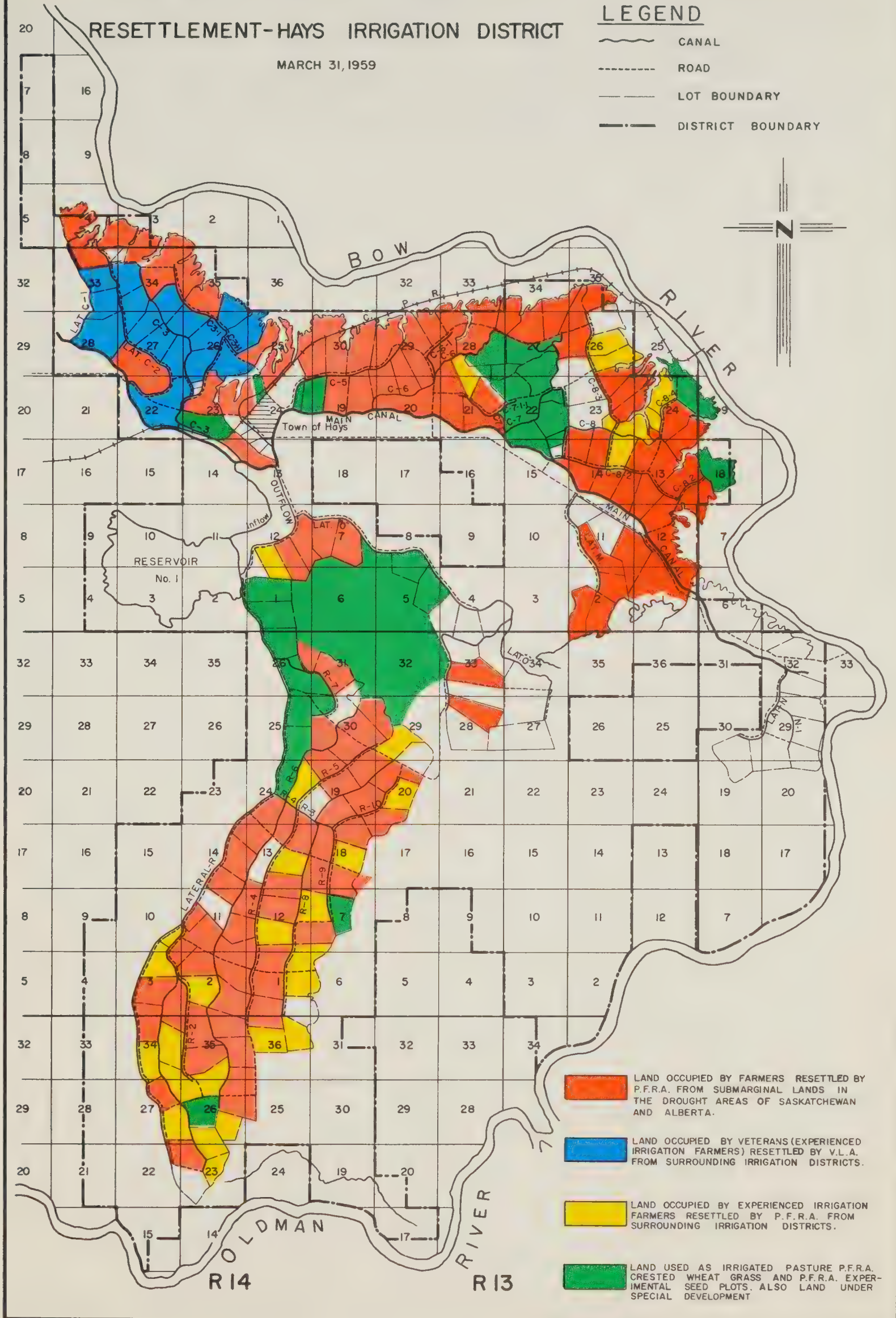
## LEGEND





-  CANAL
-  ROAD
-  LOT BOUNDARY
-  DISTRICT BOUNDARY

T 14

T 13

T 12



-  LAND OCCUPIED BY FARMERS RESETTLED BY P.F.R.A. FROM SUBMARGINAL LANDS IN THE DROUGHT AREAS OF SASKATCHEWAN AND ALBERTA.
-  LAND OCCUPIED BY VETERANS (EXPERIENCED IRRIGATION FARMERS) RESETTLED BY V.L.A. FROM SURROUNDING IRRIGATION DISTRICTS.
-  LAND OCCUPIED BY EXPERIENCED IRRIGATION FARMERS RESETTLED BY P.F.R.A. FROM SURROUNDING IRRIGATION DISTRICTS.
-  LAND USED AS IRRIGATED PASTURE P.F.R.A. CRESTED WHEAT GRASS AND P.F.R.A. EXPERIMENTAL SEED PLOTS. ALSO LAND UNDER SPECIAL DEVELOPMENT





The dry land which is exchanged for irrigated farm units, is re-grassed by P.F.R.A. and if it is not possible to incorporate this land in a Community Pasture, it is leased for hay and pasture purposes to farmers in the surrounding area. In 1958, seven hundred and sixty-four acres of cultivated land on 12 exchanged quarters were reseeded to grass. To March 31, 1959, a total of 3,866 acres of exchanged land has been taken out of cereal crop production through this phase of the resettlement program.

## MAJOR IRRIGATION and RECLAMATION PROJECTS

In addition to the Water Development, Community Pasture and Rehabilitation and Resettlement programs which have been established under the terms of the Prairie Farm Rehabilitation Act, the Government of Canada has made special provision in recent years, for the development of large "Irrigation and Reclamation Projects" in Western Canada. These major projects are usually undertaken on a cost-sharing arrangement between the Federal Government and the Provincial Government concerned, and require a special vote of Parliament for authorization.

### ST. MARY IRRIGATION PROJECT

The St. Mary Irrigation project in southern Alberta was started at the turn of the century, when a simple diversion on the St. Mary River near the international boundary was built by the Northwest Irrigation Company to bring water for irrigation to lands in the Magrath-Lethbridge region.

Under this plan nearly 120,000 acres of land were developed for irrigation by 1925 but lack of storage facilities caused water shortages to develop particularly during peak irrigation seasons. It was visualized that a plan to make full use of Canada's share of four international streams, the St. Mary, Belly and Waterton Rivers, southwest of Lethbridge, and the Milk River in the very southern part of Alberta, would not only remedy the storage problem but also supply water for an additional 380,000 acres of land extending as far east as Medicine Hat. By agreement with the Province of Alberta, the Federal Government became responsible for the financing and construction of the main reservoirs and connecting works and for the design and supervision of construction of engineering works throughout the entire project. The Province of Alberta assumed responsibility for the cost of constructing the project's distribution system and balancing reservoirs as well as for general irrigation development and land settlement.

The building of the St. Mary dam, which was completed in 1951, represented the first stage in the development and made possible the extension of the project from the original 120,000 acres of 220,000. The diversion of the Belly River and construction of Ridge Reservoir completed in 1958, was the second stage in development and made it possible to supply irrigation to over 300,000 acres. The third and final stage, the construction of the Waterton Dam and diversion canal which began in 1958, will establish an additional storage reservoir and a means of diverting the waters of the Waterton River into the St. Mary Reservoir via the Belly River Diversion Canal. This will provide irrigation water for an additional 200,000 acres bringing the total irrigable acreage to 500,000 acres.











Belly River Diversion Dam and weir showing sluiceway and canal control inlet at the left side of the picture.

Ref. No. 18053



Waterton diversion tunnel under construction. Note the heavy shoring required to retain the tunnel ceiling and walls.

Ref. No. 18066

## Investigations and Construction

During 1958 the engineering staff was engaged in further investigation and design of the Waterton Dam and appurtenant structures. Contract plans and specifications were prepared and construction commenced on the Waterton Diversion Tunnel, the Highway No. 5 bridge, and the United Irrigation District Canal Relocation. The Pothole Spillway contract started in 1957 was completed during the year. The Alberta Government completed construction of the distribution system planned by P.F.R.A. for the Cameron Ranch Tract, an area containing about 8,000 acres of irrigable land. Field surveys were carried on in the southeast block of the project for the possible extension of irrigation in that area.

## Project Improvement

Where minor capital expenditures are required to make alterations or additions, the work is generally done by P.F.R.A. staff and equipment engaged in operation and maintenance of the project. In 1958 an open drain was constructed in Division 3 to reclaim land damaged by seepage from the main canal, pressure grouting of the north abutment of the St. Mary Dam was completed, and a portion of timber catwalk in the St. Mary Diversion tunnel was replaced with concrete. Other improvement work in 1958 included the construction of Texas gates on the Belly River diversion canal, and graveling of a roadway on one bank of the main canal from St. Mary Dam to the Ridge Reservoir. Grass was seeded on the dams and dykes associated with Ridge Reservoir and along the Belly River diversion canal as well as in the Belly River weir area.

## Operation and Maintenance

During the year heavy timely showers reduced the demand for water. This, coupled with full downstream reservoirs in the spring, resulted in less water being delivered in 1958 than in 1957. With increasing acreages of specialized crops which require more moisture than that received even during the heaviest natural rainfall years, regular irrigation has become a more vital factor in the successful production of these crops.

The following table shows the development of the Project since 1952:-

<u>Season</u>	<u>New works constructed to serve</u>	<u>Old districts Served approximately</u>	<u>Water delivered to a total of</u>	<u>Water delivered acre feet</u>
1952	37,000 ac.	118,000 ac.	130,000 ac.	186,000
1953	54,000 "	118,000 "	135,000 "	196,000
1954	96,000 "	118,000 "	158,000 "	246,400
1955	141,000 "	118,000 "	159,700 "	190,000
1956	168,000 "	118,000 "	149,000 "	202,430
1957	176,000 "	120,100 "	169,900 "	314,492
1958	176,000 "	120,100 "	178,000 "	272,132
1959	184,000 "			



A fairly steady flow of irrigation water averaging 1,000 cubic feet per second, was carried in the main canal from May 7, until September. The flow was then increased to 2,000 cubic feet per second for approximately three weeks to fill Ridge Reservoir to about 2/3 of its capacity.

As a result of the long dry fall, the irrigation season was extended beyond its normal closing date to October 27 when the headgates at the St. Mary Dam were closed for the 1958 season.

Maintenance work was confined to placing waterstop in two of the joints in the Taylor Coulee Chute, riprapping the No. 1 Dam on the Main Canal, and general camp landscaping and building maintenance.

### Agricultural Development

The ideal growing conditions in 1958 combined with the use of irrigation water produced record crops in the irrigated areas. The average yield of sugar beets in 1957 and the highest experienced up to that time was 13.43 tons per acre. In 1958 the average yield increased to almost 16 tons per acre producing a total crop of approximately 150 million pounds of sugar with a return to the farmers of over 8 million dollars. The acreage of irrigated land devoted to specialized crops is gradually increasing. The following table shows the development taking place in the Lethbridge area:-

	<u>1957</u>	<u>1958</u>
Green vegetables	1,200 acres	1,500 acres
Potatoes	4,800 "	5,500 "
Canning vegetables	8,000 "	10,000 "
Sugar beets	38,000 "	38,000 "
Sunflower seeds		1,000 "



Harvesting squash on a specialized farm north of Coaldale on the St. Mary Irrigation Project.



A new industry to the Lethbridge area, oil seed processing, commenced operations in 1958. A pilot crop of some 4,500 acres of sunflower seed was grown in the area, of which 1,000 acres were irrigated. Yields on irrigated land were up to 2,000 pounds per acre as compared to dry land yield of 800 to 900 pounds. The industry is attempting to contract 150,000 acres of sunflowers for 1959 with 120,000 acres being on irrigated land.

Livestock production showed a further increase during 1958 and is becoming one of the most important sources of income in irrigated areas. Livestock sales at the Lethbridge stockyards for the past four years are as follows:-

<u>Year</u>	<u>Cattle</u>	<u>Calves</u>	<u>Hogs</u>	<u>Sheep</u>	<u>Percentage increase over previous year</u>
1955	46,815	10,008	55,863	12,094	
1956	54,735	12,048	61,155	12,595	12.7
1957	69,035	14,380	65,389	13,918	15.8
1958	63,282	17,583	89,810	13,769	13.4
1958 (x)	29,990	3,901	39,026	21,315	

(x) These figures represent "through sales" which are made elsewhere but pass through the Lethbridge yards. This is an indication of the heavy sales to United States buyers.

## BOW RIVER IRRIGATION PROJECT

The holdings of the Canada Land and Irrigation Company were purchased in 1950 by the Government of Canada and now form the basis of the Bow River Irrigation Project. The Company had developed 57,000 of the 240,000 acres of irrigable land in the project. Canada, through P.F.R.A. and by agreement with Alberta, undertook the renovation and enlargement of existing works and the extension of irrigation to a greater acreage. The work of renovating and enlarging the existing works is now almost completed. About 8,000 acres in the West Block is currently being developed for irrigation by the Province with the assistance of the P.F.R.A. engineers who plan and design the irrigation structures and prepare the necessary specifications for construction. Some 27,000 acres of new land have been developed by Canada in the Hays District. The remaining 76,000 acres are in the East Block, the development of which will be the responsibility of Alberta

### Construction

The construction work on Lake McGregor, which consisted of raising Lomond Crossing and strengthening the South Dam, was completed during the year. The construction of Drop 7A continued through 1958 and should be completed early in 1959. In addition, one concrete check-struct-











ture, seven timber bridges, and the relocation of Lateral 'A' were undertaken during the year.



Lomond Crossing in 1958 following reconstruction made necessary by increased storage capacity of Lake McGregor, a storage reservoir on the Bow River Irrigation Project.

Ref. No. 16694

### Renovation and Maintenance

Project maintenance crews constructed and repaired a total of 262 structures. Most of this work was carried out in continuance of the policy of replacing all worn out wooden structures with structures of concrete and galvanized pipe. Much of the above work was made necessary by the relocation of Highway No. 36 from Vauxhall north to the Bow River.

Heavy spring runoffs caused considerable damage to the Syphon Crossings on both the West and East Arrowwood Creeks. Although the pipes remained intact, several cradles, stringers and piers had to be replaced. The upstream channel of the West Arrowwood Creek was straightened out to give the creek waters a better approach to the Syphon Crossing.

A total of approximately 350,000 lineal feet of canal laterals was either renovated or relocated during 1958. Earth moving equipment owned by P.F.R.A. was made available at cost to farmers located in the Vauxhall and Hays areas for excavating dugouts and farm water supply trenches, cleaning out head-ditches, building farm fills, and land levelling.

## Drainage

The drainage improvement program was continued in 1958 with 25 miles of open drain ditch constructed, 90 percent of which were shallow drains. No new tile drains were installed but about 1000 feet of tile drain were re-laid when it ceased to function properly. As construction progressed some 121 small structures such as culverts, inlets and drops were installed in the drains. Three new return flow gauging stations were added to the four established previously on the project.

## Operation and Irrigation

The ideal growing conditions experienced in 1958 were followed by practically ideal harvest weather. The total precipitation was above the long-term average at both Vauxhall and Hays. Good rains in June and July combined with irrigation, produced one of the best crops ever experienced in these areas. Unfortunately, 40 out of the 160 farmers at Hays suffered from 80-100 percent hail damage in July.

Timely summer rains reduced the irrigation requirements. Whereas 78,157 acre feet of water were delivered to 634 farm units in 1957, six hundred and forty eight farm units received only 69,121 acre feet in 1958. In the Hays area 9 parcels received water for the first time. Water was turned into the main canal on May 4 and discontinued on October 20. About 1/3 of the total flow of 104,850 acre feet was lost through seepage and evaporation or returned to the rivers through wasteways. Water was again delivered to the Bow River Development acreage in the Enchant and Travers areas. They received a total of 3,809 acre feet during 1958 which was about a 20 percent increase over previous years.

The main canal from the Bow River carried a flow of 800 c. f. s. from June 27 to October 15. During that time 150,155 acre feet of water were diverted from the Bow River to Lake McGregor. Due to the high natural spring runoff received in the Travers Reservoir from the Little Bow River in 1958, only 75,000 acre feet of water were diverted from Lake McGregor into the Travers Reservoir. The remainder was retained in Lake McGregor increasing the year-end storage to 208,500 acre feet as compared with 130,000 acre feet in 1957.

## Resettlement

The policy of resettling farmers from submarginal prairie farms, veterans, and experienced irrigators from other areas on land in the Hays Irrigation area was continued during 1958. Twelve farm units in this area were allocated during the year. Under the P.F.R.A. policy of assisting settlers to become established, 6,400 bushels of seed grain, 500 pounds of



pasture mix seed, and 3000 pounds of Vernal alfalfa were distributed to farmers on the project. The seed grain is supplied on the basis of 2 bushels of threshed grain for each bushel of seed grain received, while forage seed is distributed at cost.

As the original problems of settlement are now superseded by problems of rehabilitation, the settlement policy for the Bow River Project was amended in February 1959 to provide low interest loan assistance for the purchase of fencing materials and livestock. In addition, Crown Lands developed for settlement were made available on the basis of sale at prices prevailing in the district. The granting of trial leases has been eliminated. For more details of resettlement refer to the Bow River section of the Rehabilitation and Resettlement Program of this report.

### P a s t u r e s

The irrigated pastures at Vauxhall carried 1,051 head of cattle from May 15 to October 5, a grazing period of 143 days. Rotational grazing was practiced and frequent light irrigations were used to increase carrying capacity and maintain good grass cover. Fertilizer was applied and spraying was carried out to improve the stand and control weed growth.

The East Hays Pasture, containing 1,100 acres, of which 285 are irrigated, carried 350 cattle from May 10 to October 14. The cattle came off in good shape and the pasture held up well. One hundred and thirty acres of dry land in this pasture were seeded to crested wheat grass and alfalfa. This area will provide spring pasture each year until the growth on the 285 acres of irrigated tame pasture is ready for grazing.

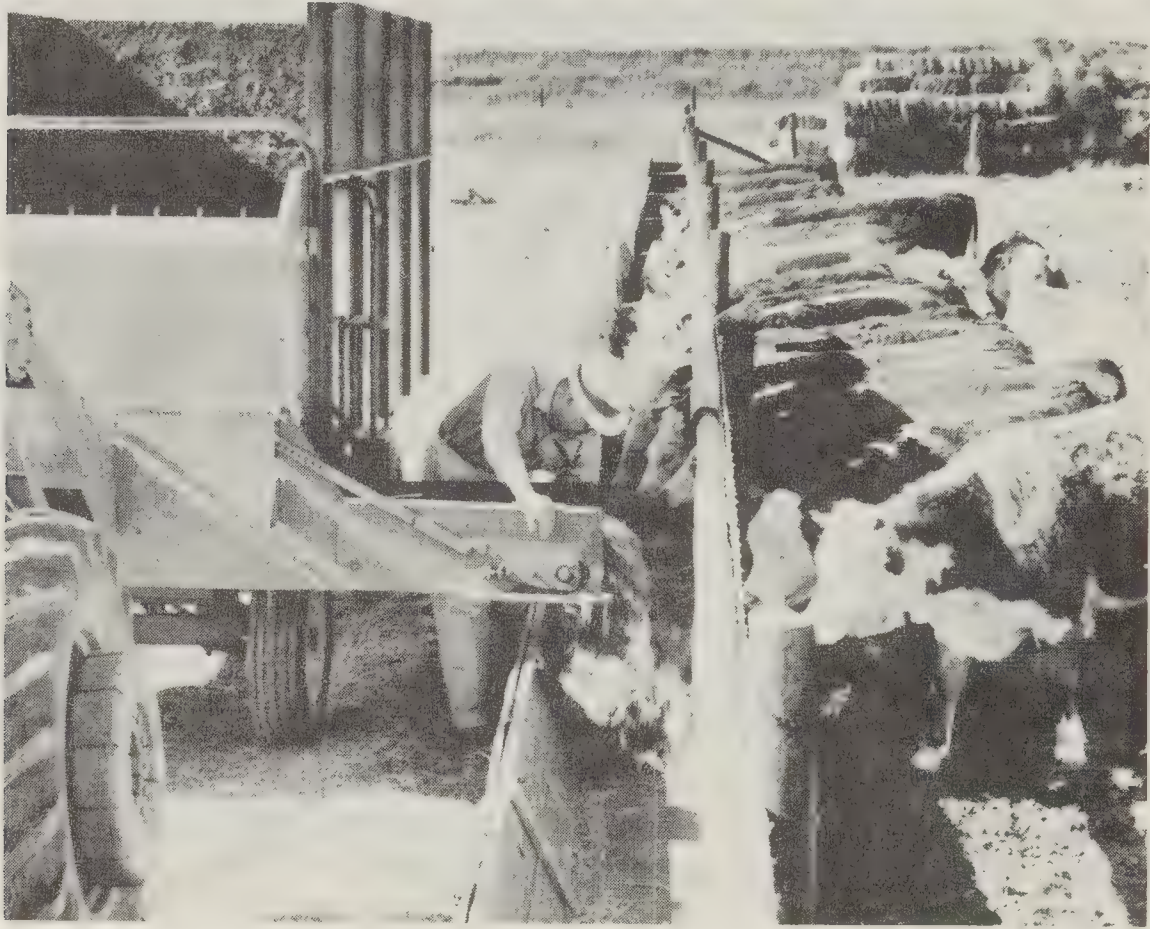
The new 3,210 acre sheep pasture south of Hays was closed to grazing during 1958 to allow the native grass to recover after many years of overgrazing. Development work on 538 acres of irrigable land in the pasture was completed in 1958.

### A g r i c u l t u r a l   D e v e l o p m e n t

The grain harvest was about average in the Hays district. Specialty crops such as potatoes, turnips, carrots, tomatoes and beans were grown in the 1958 season on a trial basis. Problems experienced in this type of production are being gradually overcome. Livestock production continues to be a valuable source of farm income. Cattle feeders experienced a profitable year and hog producers supplied regular weekly shipments to the Calgary market. More settlers are now finishing their cattle and lambs before marketing them. This trend has been encouraged by the formation in 1958 of the Hays Feeder Association, an organization which will make loan capital available for livestock feeding. Approximately 2,000 lambs and 150 cattle

are on feed in the Hays district this winter.

A mechanical grazing demonstration was undertaken in 1958. Forty head of cattle were finished on the production of grass from 17 acres of irrigated land. The cattle were confined and the feed was cut and hauled to them twice daily. This experiment provided some interesting results and is expected to be continued with a few modifications.



Freshly cut greenfeed being fed to livestock in a mechanical grazing experiment undertaken near Hays, Alberta on the Bow River Irrigation Project.

Ref. No. 18023

A program to control weed growth along the canals and road allowances has been established by P.F.R.A. Under this program 300 acres of land in the Hays district, and the entire distribution and drainage systems in the Vauxhall area were sprayed, using 2-4-D volatile ester. Additional spraying was undertaken in weed infested areas on the project. Fall spraying to control regrowth on areas sprayed in June was done on an experimental basis in October.



## SOUTH SASKATCHEWAN RIVER PROJECT

In July 1958 an agreement was signed between the Province of Saskatchewan and the Federal Government, authorizing the construction of the South Saskatchewan River Project, a large multi-purpose water conservation project on the South Saskatchewan River in south-central Saskatchewan. The purpose of the project is to develop the water resources of the river for irrigation, power development, flood control, streamflow regulation, urban water supply, and recreation. Control of the river will be achieved by the construction of two dams, the major one on the South Saskatchewan River midway between the towns of Elbow and Outlook, the other southeast of Elbow at the summit between the valleys of the South Saskatchewan and Qu'Appelle Rivers.

The agreement provides that Canada and Saskatchewan will share the cost of building the above structures and all other works associated with the creation of the reservoir. Seventy-five percent of the cost is to be borne by Canada and twenty-five percent by Saskatchewan, with Saskatchewan's share not to exceed \$25,000,000. The contribution of the Government of Canada toward the cost of the project is in accord with its long range resources development plan to provide for expansion and stability in Canada's growing economy.

Surveys and investigations to determine the feasibility of this project were first undertaken by P.F.R.A. in 1943. Sites were investigated throughout a 100 mile stretch of the river from Outlook to a point north of Swift Current. Topography and the location of materials led to the selection of site 10 some 18 miles upstream from Outlook.

### Construction

Eight contracts totalling approximately six million dollars were awarded from October 1958 to March 31, 1959. During the fall and winter months construction was advanced on four of these contracts. The east access road was practically completed by the end of 1958. Work on the contract for processing the concrete aggregate required during construction period, started in the spring of 1959. The water, sewer and street services for the construction headquarters were almost completed by the end of the fiscal year. Construction on the forty housing units and five headquarters buildings continued throughout the winter of 1958-59 with the completion date of the contract being June 30, 1959. Work on the construction bridge substructure was carried on during the winter months with Number 2 and 4 piers, and the west abutment being completed by the end of March. No work was done on the first stage of the east embankment, the north access road, or the wellpoint water supply contract during the 1958-59 season.



Winter construction of P.F.R.A. headquarters at the South Saskatchewan damsite showing the east access road in the background.

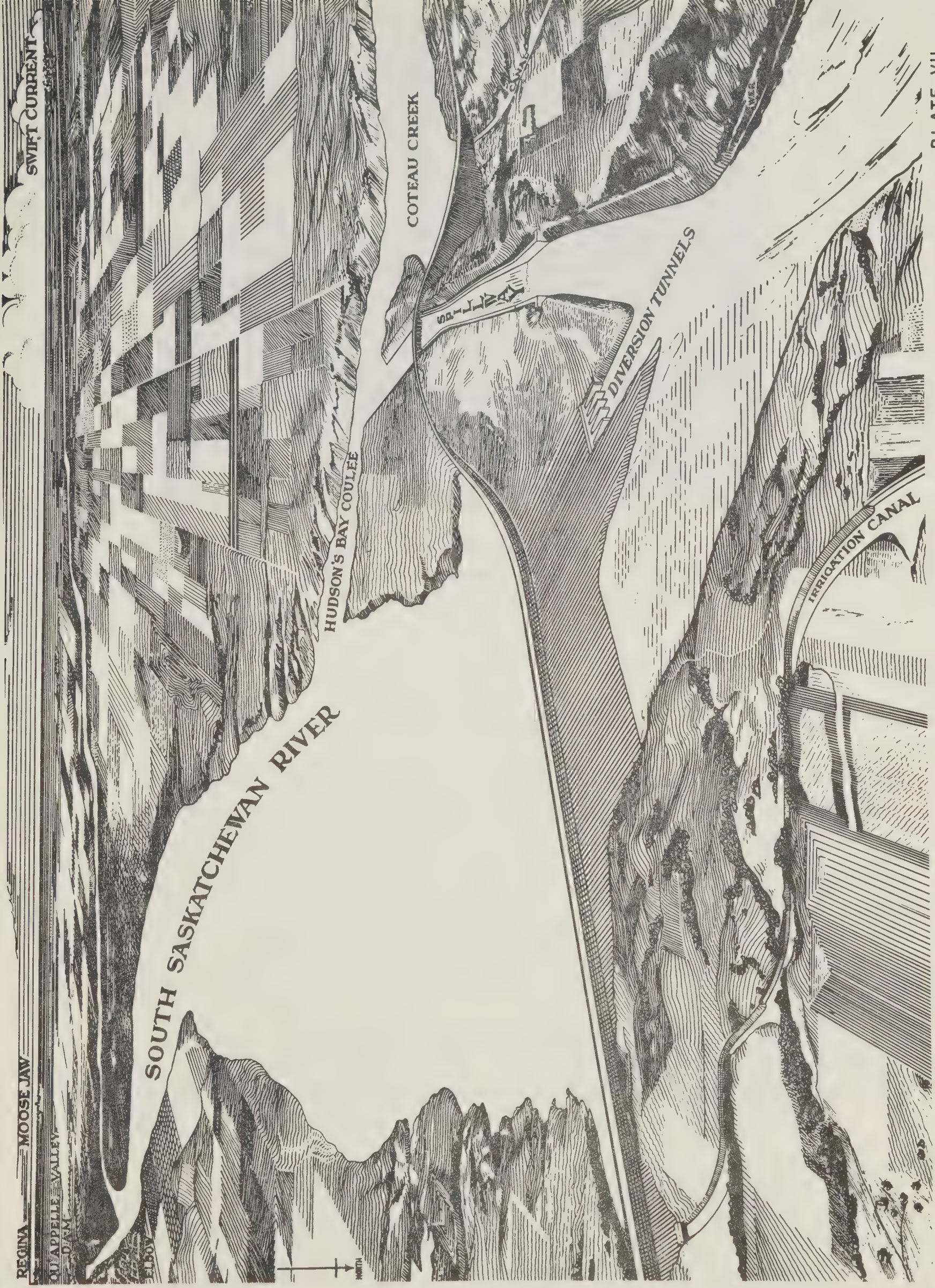
Ref. No. 17100



House construction during the winter of 1958-59 at P.F.R.A. construction headquarters, South Saskatchewan damsite.

Ref. No. 17130





REGINA — MOOSE JAW

SWIFT CURRENT

SOUTH SASKATCHEWAN RIVER

HUDSON'S BAY COULEE

COTEAU CREEK

RAILWAY

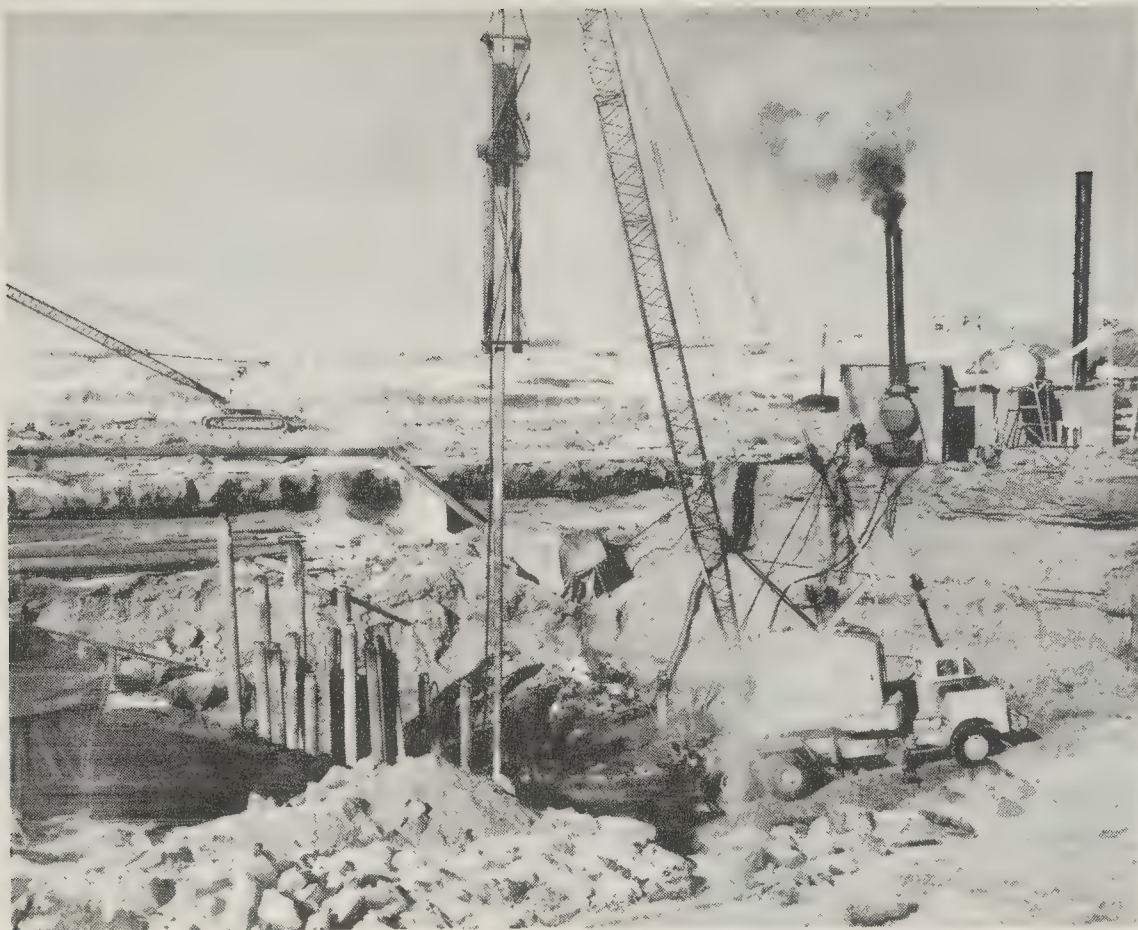
DIVERSION TUNNELS

IRRIGATION CANAL









Jetting foundation piles for the west abutment of the construction bridge which is located about the centre of the Saskatchewan River. Note the sandpoint system used for dewatering the construction area.

Ref. No. 17121

### Field Operations

Surveys were made for the location of a possible canal line from Blackstrap Reservoir to Lewis Creek as well as possible future irrigation and water supply reservoirs in Lewis Creek area. The basic information required to establish an aerial topographic mapping of the main reservoir area between Elbow and the damsite was completed during the year. Other surveys included the location and elevation of 1,000 bore holes, a large-scale topographic map of the East Viewpoint area, and right-of-way surveys for the east and north access roads. In addition, the construction surveys required in the damsite area were continued.

Drilling and foundation investigations were carried out in the east embankment area, in the portion of the river bed which will be beneath the embankment and at all structural locations and borrow areas on the west side of the river.

A revised program of streamflow and silt sampling was instituted in the spring of 1958. Regular streamflow measurements, sediment sampling and gauge readings were recorded at Outlook. Water level elevations were also recorded at the P.F.R.A. pumphouses at Elbow from July to October 1958. The streamflow measurements at Outlook showed the highest discharge during 1958 to be 37,113 c.f.s. in April, with a low flow of 5,097 c.f.s.

in September.

### Pre-Development Farm

To study irrigation techniques and practices under the soil and climatic conditions prevailing in the district which will be served by the South Saskatchewan River Project, the Federal Government has established a pre-development irrigation and experimental farm near the town of Outlook, Saskatchewan. Water for irrigation is obtained by pumping from the South Saskatchewan River near Outlook.

The farm which contains 171 acres, is divided into two parts. Approximately sixteen acres of this farm are operated by the Experimental Farms Service for detailed experimental work on irrigated crops and soils. The remaining 155 acres are operated by P.F.R.A. to demonstrate on a field scale, farming practices and irrigation methods feasible in that area. Irrigation is planned so that both sprinkler and gravity methods of irrigation are used on the farm. A carefully planned soil improvement program using a ten-year rotation, commercial fertilizers, manure and legumes, has resulted in a steady improvement in crop yields since the program was first started.

In 1958, pumping for irrigation commenced on May 8 and ended in September with about 6 percent more water being pumped than in the previous year. Not considering losses from leakage, seepage and evaporation, there was an average of 16 inches of water used on the farm during the season. Rainfall during the same period was 8.1 inches, almost 2 inches more than in the 1957 season.

The basic crop rotation was adhered to with the exception of one field of brome grass-alfalfa mixture which winter-killed in the winter of 1956-57. This field was not reseeded to brome grass-alfalfa but instead to Garry oats in 1958 and will be seeded to wheat in the spring of 1959 to start the basic rotation again.

Farm yields for 1958 and previous years were:

<u>Crop</u>	<u>Yield per acre</u>			
	<u>1955</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>
Hay	2.1 tons	3.4 tons	3.1 tons	3.5 tons
Oats	51 bus.	88 bus.	89 bus.	97 bus.
Barley	39 bus.	57 bus.	51 bus.	58 bus.
Wheat	32.8 bus.	48 bus.	33 bus.	50 bus.
Potatoes	415 bus.	407 bus.	250 bus.	270 bus.



No cattle were grazed during the summer and fall of 1958, instead the pastures were cut for hay or worked down and reseeded.

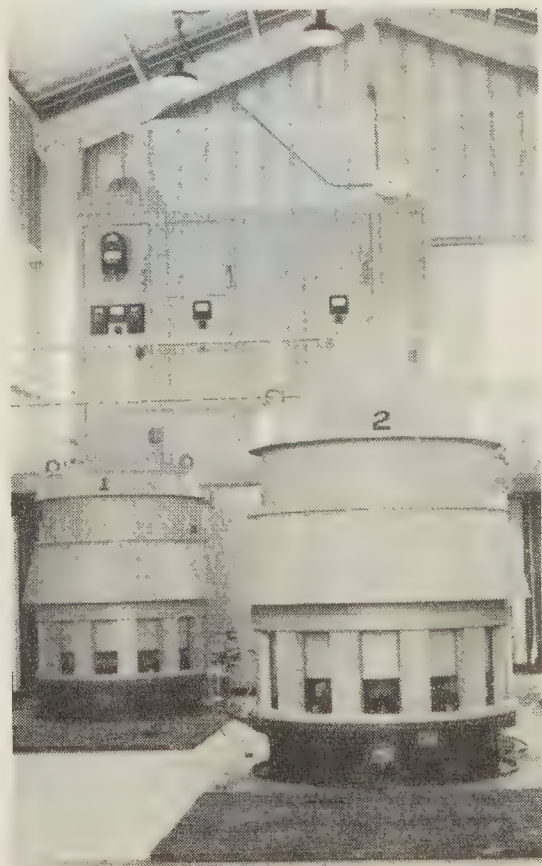
## BUFFALO POUND LAKE WATER SUPPLY PROJECT

Buffalo Pound Lake, located in the upper Qu'Appelle Valley about twenty miles north of the city of Moose Jaw, is one of the principal sources of urban water supply for the cities of Regina and Moose Jaw. Through an agreement with the Province of Saskatchewan, the Government of Canada has accepted the responsibility for maintaining the water level of the Buffalo Pound Lake Reservoir. This project will become an integral part of the South Saskatchewan River Development when the South Saskatchewan Dam is completed.

Pending construction of the South Saskatchewan River Dam, the level of Buffalo Pound Lake is to be maintained by supplementing the flow of the Qu'Appelle River. Works were begun in 1955 for the pumping of some 90 c.f.s. of water from the South Saskatchewan River at Elbow, a vertical distance of 107 feet, into a high level canal which carries this water some 12 miles to the summit of the Qu'Appelle Valley. The second part of this project was to improve the flow conditions of the Qu'Appelle River between the summit of the Qu'Appelle Valley and Buffalo Pound Lake, a distance of 48 miles. Construction of this project was completed in June 1958.



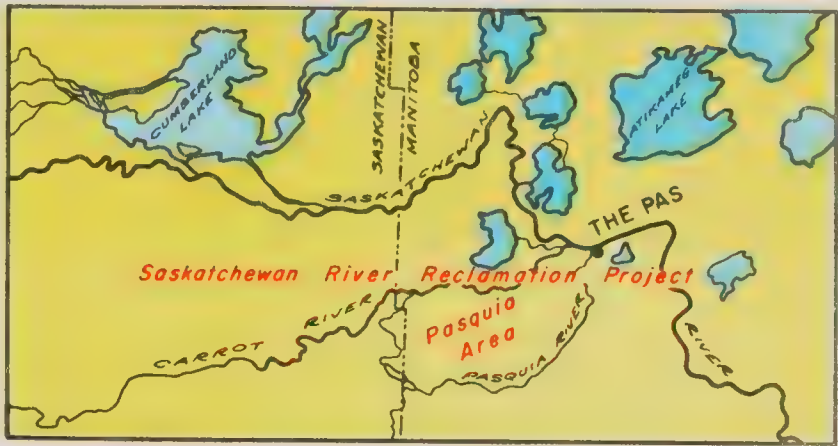
Pumphouse No. 2 and reservoir canal with overflow on the left and the two 36" discharge pipes in the foreground.



Interior of Pumphouse No. 1 showing the two 350 H.P. motors and controls.

In 1958-59 two pumping tests were carried out to check for operational problems. The following improvements to the pumping and conveyance systems were made during the fiscal year; 1,500 cubic yards of gravel were placed around the structures and on the access roads, "Hydrauger" drains were installed below No. 1 Outlet Structure to collect seepage, 28,500 cubic yards of material were excavated from "Old Baldy" to reduce the slide hazard to the canal near No. 1 Pump Site, and control of weed growth along the canal. Maintenance of Buffalo Pound Reservoir impounding works consisted of replacing the natural willow which had been destroyed, with gravel and rock rip-rap for bank protection and the repairing of cables and cable fastenings at the No. 2 Outlet Control Structure.





INSERT AREA LOCATED 50 MILES NORTH OF PORCUPINE FOREST RESERVE

DEPARTMENT OF AGRICULTURE - CANADA  
P.F.R.A.

# GENERAL LOCATION PLAN MANITOBA REGIONAL PROJECTS

MARCH 31, 1959







## SASKATCHEWAN RIVER RECLAMATION PROJECT

Along the lower course of the Saskatchewan River there has been built up an extensive delta area reaching from Tobin Rapids in Saskatchewan to Cedar Lake in Manitoba. It has been estimated that this silt and clay delta contains about one and one half million acres of potentially arable farm land. The reclamation of this land requires the establishing of proper drainage facilities and flood prevention works.

Investigations began in 1950 to determine the feasibility of reclaiming portions of the Saskatchewan River delta. By joint agreement between the Federal and the Manitoba Governments, P.F.R.A. in 1953 undertook the actual development of the "Pasquia Area" located southwest of The Pas between the Carrot River and the Pasquia River, as a pilot project. In this area, containing some 135,000 acres, it is expected to reclaim approximately 110,000 acres of arable land. The experience gained in the Pasquia Area will provide a valuable guide should it be decided to develop other areas throughout the remainder of the delta region.

### S i p a n o k   A r e a

A topographic survey program of the Sipanok Area was completed in 1957. Annual hydrometric surveys to study the rate of discharge of water and sediment into and through the Saskatchewan River Delta between Tobin Rapids and The Pas, provide information essential to the possible reclamation plans and also supply data valuable in the operation of the Pasquia Project.

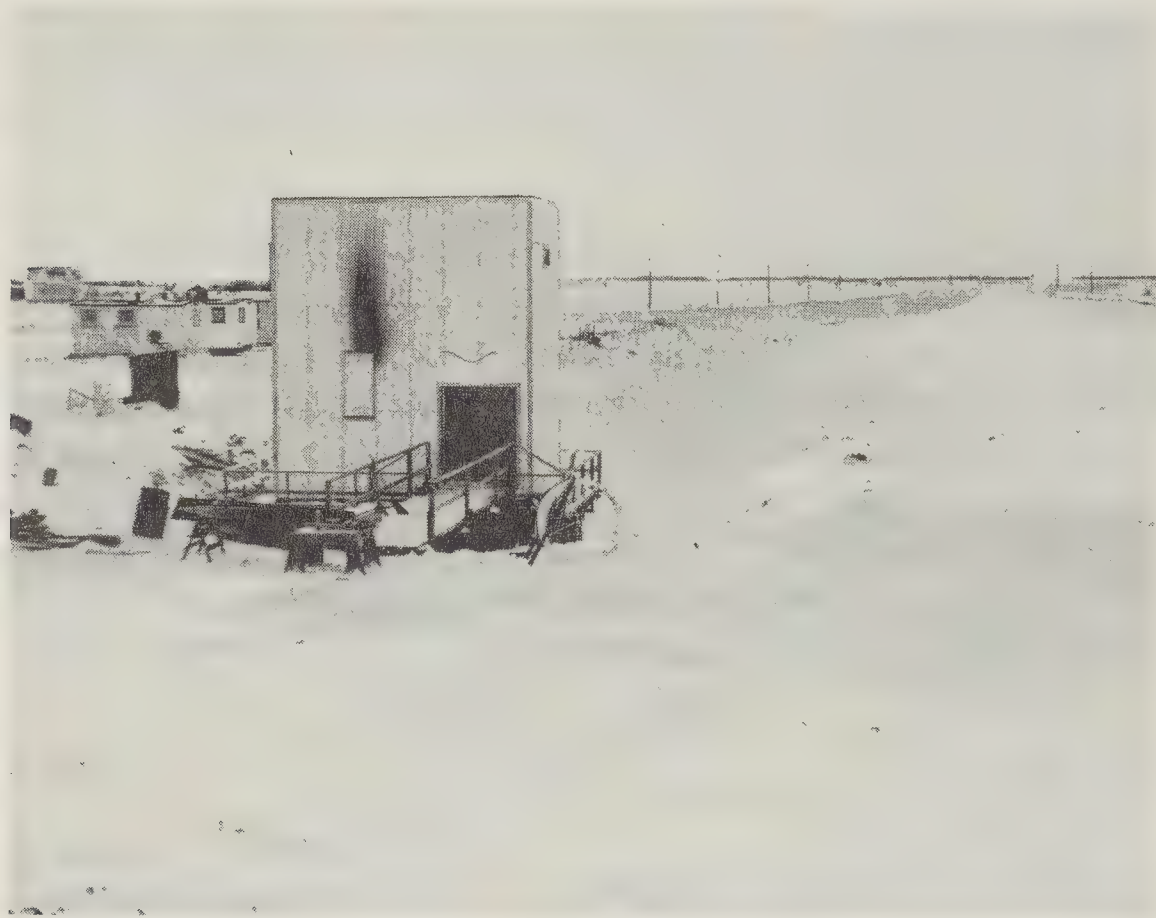
### P a s q u i a   A r e a

Since development began in the Pasquia Area in 1953, dykes have been established along the Carrot and Pasquia Rivers, a drainage system is now almost completed, and a network of roads to service the area is being constructed. During the year, construction, investigation and development surveys were carried out to supply the required information needed for the establishment of 30 miles of drains and 50 miles of roads.

### C o n s t r u c t i o n

Pasquia Drainage Contracts No. 2 and No. 3 were completed in 1958. These contracts were for the construction of the drains, dykes and controls necessary to carry the drainage water gathered in the northeast portion of the project to Pumping Plant No. 2 which is located at the Control Dam on the Pasquia River near The Pas, Manitoba. Construction of Pumping Sta-

tion No. 2 commenced on November 1, 1958 and is to be completed before March 31, 1959. Work started in December 1958 on the fourth and final drainage contract. This contract, to provide for drainage in the western section of the project, is to be completed by June 30, 1959.



Completed Pumphouse No. 2 located at the control dam on the Pasquia River southwest of the town of the Pas, Manitoba.

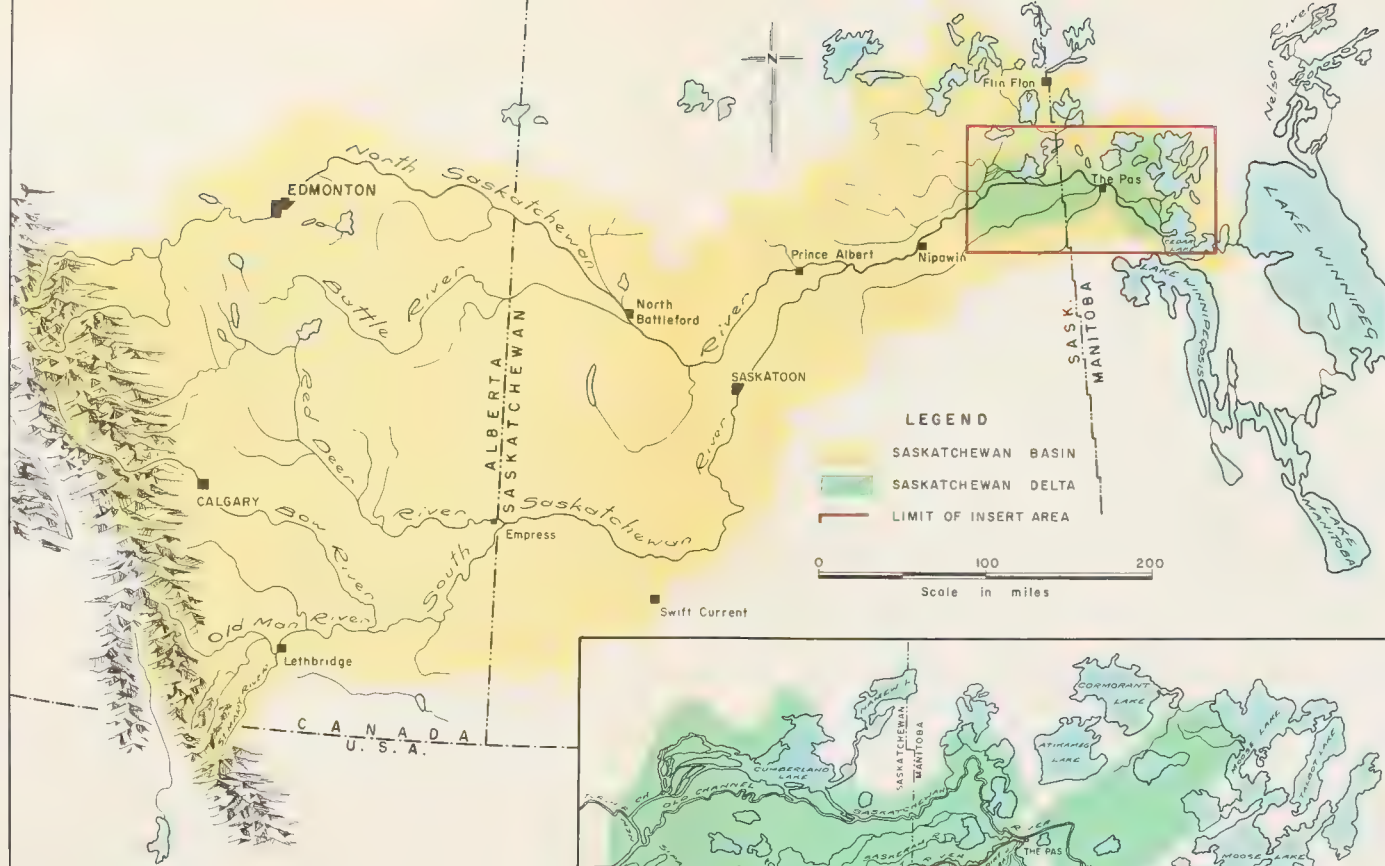
Ref. No. 17006

Miscellaneous construction on the Pasquia Project included the completion of Drain H and I and the Pasquia Salt Lake drain, ditch dynamiting of 1,800 feet of pilot channel for Ditch F, installing several culverts and road approaches, preparing for seeding down of spoil banks and berms, and the installation of three drainage ditch control structures. All project maintenance and improvement work throughout 1958 was supervised by the P.F. R.A. office located at The Pas.

### Operation

In operating the project approximately 50,000 acre feet of water were discharged through the Control Dam located on the Pasquia River which now serves as a main drain for the reclaimed areas. Control Structure No. 1 completed late in 1957 operated satisfactorily to prevent flooding of the Pasquia Lake area in the southeast section of the project. Three drainage ditches in the central part of the project were extended to permit a larger amount of water to enter Big Lake which is drained through the former Pasquia River.





# LEGEND

SASKATCHEWAN BASIN

SASKATCHEWAN DELTA

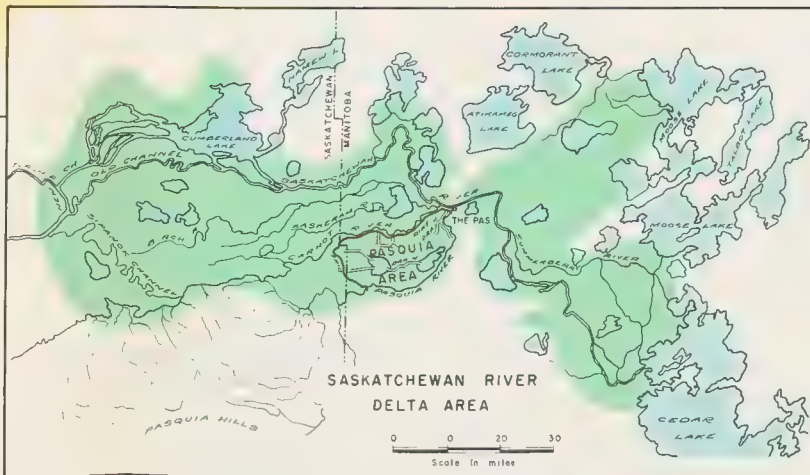
LIMIT OF INSERT AREA

0 100 200  
Scale in miles

DEPARTMENT OF AGRICULTURE - CANADA  
P.F.R.A.

## SASKATCHEWAN RIVER RECLAMATION PROJECT SASKATCHEWAN RIVER DRAINAGE BASIN

MARCH 31, 1959







The permanent pump at Mile 14 which discharges into the Carrot River operated for about 3 weeks in the spring, facilitating the construction of drains and preventing the flooding of cultivated land in the northwest part of the project.

### Field Investigations

Twenty-one water level gauges established in the Pasquia Area to collect data on the behavior of lakes and stream elevations, indicated a marked improvement in the general water level of the reclaimed area. During the fall of 1958 six additional gauges were installed.

The meteorological station on Sec. 2-55-29/W1 in the Pasquia Area operated during the summer of 1958 recording rainfall, temperature, evaporation and wind velocity data. Rainfall from May 8 to October 31 was 9.55 inches as compared with the 46-year average of 11.8 inches for the same period. The frost-free period in 1958 was 102 days, eight days less than the long-term average.

## NORTHWEST ESCARPMENT and INTERLAKE RECLAMATION PROJECTS

Land reclamation projects along streams flowing off the northern and eastern slopes of the Riding, Duck and Porcupine Mountains, and in the area which lies between Lake Winnipeg and Lake Manitoba, are authorized under the terms of the Federal-Provincial Northwest Escarpment and Inter-lake Region Agreement.

### Riding, Duck and Porcupine Mountains

A combination of soil and vegetation problems coupled with steep topography through much of the Northwest Escarpment area creates a serious erosion and flood problem in an area containing over 252,000 acres of valuable agricultural land. To minimize the damage to farm lands, P.F.R. A. is carrying out a program of investigation and construction to provide flood protection and to reduce erosion problems.

### Surveys

The establishing of vertical and horizontal ground controls for a photogrammetric study of 14 proposed damsites and reservoirs on the Woody River watershed concluded a study started in 1957. These field surveys on the Woody River were concentrated in the headwaters area near the Manitoba-Saskatchewan boundary. Surveys and investigations were also carried out on the lower Woody River in Manitoba, where flooding is a serious problem.





Looking east over the Riding Mountain escarpment area showing the eroded shale mountain slope in the foreground.

Ref. No. 18303-2

To permit a detailed evaluation of hitherto unassessed factors such as topography, soils, vegetative cover, precipitation, and runoff, an experimental watershed was chosen in the headwaters of Wilson Creek. The setting up of the test area involved surveys to establish the location of access roads, rainfall measuring apparatus, and controlled stream metering stations. Detailed topographical surveys of stream profiles and possible headwater storage reservoirs were also undertaken.

### Construction

Most of the construction for 1958 was carried out in the Wilson Creek watershed. In addition, minor repairs were made to existing projects and some bank protection work started previously was completed during the year.

In the Wilson Creek control area the work consisted of construction of an access road, clearing secondary trails, and the installing and servicing of rain gauges and metering sites. In conjunction with the control area, precipitation and water level stage recorders were placed elsewhere in the Northwest Escarpment area.





Access road on the Wilson Creek Project showing the type of vegetation in the surrounding area.

Ref. No. 16864

Work in the Duck Mountain section consisted of the construction of one mile of road through the forest from Beaver Lake road into the Pine River headwater area. The Steep Rock Lake Dam and one and one-half miles of access road were built in the Porcupine Mountain Forest Reserve during 1958. This work was carried out by Provincial forces working under the Agreement.

Minor clean-up and improvement work was carried out in the Mineral Creek project completing the flood control scheme begun in 1957. Experimental stream bank erosion control work undertaken a year ago on Edwards Creek was concluded this year. A limited amount of grass reseeding was done in the Wilson River area.

#### Interlake Reclamation Area

Hay and grain production in the Interlake area between Lake Winnipeg and Lake Manitoba has been seriously curtailed as a result of damaging runoff floods along the rivers and streams that drain into major lakes. The activities of P.F.R.A. have been designed to alleviate these conditions

in three of the most seriously affected areas; the Swan Creek-Burnt Lake watershed, the Icelandic River system, and the Fish and Dennis Lake Basins.

## Surveys

Detail surveys were carried out along the Icelandic River and on the land immediately adjacent to it. A report on possible methods of flood control in this area will be completed in May 1959. Surveys to devise a scheme for regulation of runoff from Fish Lake and Dennis Lake required 360 miles of levels and entailed hand clearing of 80 miles of line through scrub and brush. In the Swan Creek-Burnt Lake area, surveys were completed which established the required lines and grades for the letting of a 30-mile drainage improvement contract from Lake Manitoba to Burnt Lake.

## Construction

Work started on the Burnt Lake Drain in October 1958. Cold weather and deep snow caused operations to stop in mid-November with approximately twelve miles of the drain being completed.

## ASSINIBOINE RIVER PROJECT

The responsibility for flood control along the Assiniboine River was transferred in 1950 from the Federal Department of Public Works to the Department of Agriculture. Since that time P.F.R.A., in co-operation with the Province of Manitoba, has carried out a flood control program to protect the farm lands in the Lower Assiniboine River area which extends approximately 125 miles east from Brandon to Headingly, Manitoba. Most of the flood-protection work is located east of Portage la Prairie where dykes and river cutoffs have been constructed and maintained to prevent flooding of farm lands and to improve streamflow conditions in the river.

## Upper Assiniboine River

### Surveys

In recent years, to investigate other measures of flood control and water conservation, surveys have been conducted to determine the effect that storage in the Upper Assiniboine Basin would have downstream. During 1958 detailed studies were made of the features of 20 proposed headwater control reservoirs. The effect that various combinations of these reservoirs would have on downstream floods and low water control was presented.

In 1958 damsite surveys were completed on the Shell River and Silver Creek, tributaries of Upper Assiniboine River. In addition, a com-



prehensive agricultural survey was conducted on the Assiniboine River between Kamsack, Saskatchewan and St. Lazare, Manitoba, to determine the amount of agricultural land subject to flooding in that area.

## Lower Assiniboine River

### Surveys

Surveys were undertaken during 1958 to study the feasibility of establishing a large reservoir between Portage la Prairie and Brandon. Such a reservoir would provide flood control, streamflow regulation, and a water supply for a large area of southern Manitoba. Possible damsites were selected using photogrammetric methods, and ground controls were established by survey crews.

### Construction

A total of two and one half miles of dykes was constructed along the Assiniboine River near High Bluff, Manitoba. The property needed to close the last gap in the dykes within the R.M. of Portage la Prairie has been acquired and brush clearing was completed this winter in preparation for construction of the final closure in this area.

Early in 1958 the Mill Creek floodway was repaired and enlarged and eighteen miles of dykes and borrow areas in the High Bluff region were seeded to grass.



Seeding dykes along the Assiniboine River near Portage la Prairie, Manitoba.



## RIVERS WATER STORAGE PROJECT

A request for the construction of a general-purpose dam on the Minnedosa River, adjacent to the Town of Rivers, was received in 1956 from the Manitoba Government. Authority to construct this project was granted the following year and the contract for construction was awarded early in 1958. The total estimated cost of the project, which is expected to require about two years to construct, is over one million dollars. Work began on the dam and its appurtenant structures in mid-June 1958 and by the end of the construction season, this project was about 40 percent complete.

The dam, which will be 4,100 feet long and 75 feet high, will create a reservoir which, when full, will impound 25,000 acre feet of water. Located on a main tributary of the Assiniboine River this project will provide a reliable supply of water for livestock throughout the areas associated with the project and will be of sufficient size to make water available for domestic use in the surrounding rural and urban communities. The Rivers project will also assist in maintaining the streamflow in both the Minnedosa and Assiniboine Rivers during dry periods when normal streamflow might cease or be insufficient to provide for proper sanitation and riparian requirements.



Conduit outlet structure for reservoir created by the dam constructed on the Minnedosa River near the town of Rivers, Manitoba.



In addition to the main contract, two other jobs connected with the project were undertaken and completed in 1958. The brush was cleared from around the margin of the reservoir and a one-mile road diversion was constructed. In December a contract was let for the construction of a timber and steel bridge to replace a bridge that will be flooded out when the reservoir is full. Work began on this structure in January 1959 and by March 31 was 80 % complete.

## BRITISH COLUMBIA PROJECTS

The activities of the Prairie Farm Rehabilitation Administration in the Province of British Columbia during 1958-59 were confined to the planning and commencement of construction of one major irrigation project, improvement of one existing project, and reconnaissance investigations of the possible extension of a Veterans' Land Act project to include additional lands.

During 1958 an agreement was reached between the B.C. Fruitlands Irrigation District, the Province of British Columbia, and the Federal Government for the rehabilitation of the district on a cost sharing basis. The planning and supervision of construction is being carried out by P.F.R.A.

The B.C. Fruitlands Irrigation District is an old established irrigation district initially consisting of some 2,900 acres north and west of the Village of North Kamloops. Irrigation water for this project was supplied by gravity from Jamieson Creek with supplementary water pumped from the North Thompson River. Having been in operation for over 40 years, this system had deteriorated to the point where the district could no longer guarantee the delivery of water to many of its users.



General view of Block C of the B.C. Fruitlands Irrigation District at North Kamloops, B.C.

Planning for the renovation of this project was carried out during the summer months of 1958 and construction by contract began in November 1958 with completion date set for May 1, 1959. The construction work involves minor repairs to the upper end of the canal, ditch, and flume system to service some 500 acres, and the installation of two separate pumping plants to supply irrigation and domestic water through a closed pipe system to 1,500 acres of agricultural land and some 700 small holdings of one-half acre or less.

The Penticton West Bench Project completed in 1954, experienced further trouble in 1958 with their automatic pump controls. This was corrected early in 1959 by P.F.R.A. engineers with the installation of more sensitive controls. To relieve water hammer which developed in a new section of the system, a four-inch swing check valve was installed in one of the main laterals. These alterations made up the project improvement work by P.F.R.A. in 1958-59.

During the year a preliminary reconnaissance investigation was carried out by P.F.R.A. for the Lakeview Irrigation District on the Veterans' Land Act Westbank project situated on the benchland across the Okanagan Lake from Kelowna, B.C. The economic possibilities of including some 1,000 acres of private land in the Lakeview Irrigation District was investigated with special regard to a delineation of land suitable for agriculture or subdivision, the available storage on upstream reservoirs, and the cost of irrigation of these lands through a pressure distribution system. This report was completed and turned over to the Lakeview Irrigation District in April 1959.



## ENGINEERING SERVICES

A number of Divisions, under the general heading of Engineering Services, have been set up to supply basic information required by P.F.R.A. This information, which is usually not available from other sources, is generally of a technical nature requiring highly specialized knowledge, training, and equipment.

### DESIGN DIVISION

The Design Division is responsible for the major engineering, planning and design work for all P.F.R.A. divisions and services. Certain engineering components of projects are done by other divisions giving engineering services, and this information is used by the Design Division in its own work, or integrated as supplied, into the completed design.

The engineering success of water-carrying structures is dependent to a great extent upon information gathered in regard to the hydraulic behaviour of structures obtained from scale-model testing under actual flow conditions. For this purpose, the Design Division operates a modest but well-equipped hydraulic laboratory in Regina.

During 1958-59 the Division designed the necessary structures for ten major projects, eight of which reached construction stage. A substantial amount of design work of a preliminary and investigational nature was done for other offices and divisions. The drafting department during 1958-59 produced about 650 detailed engineering drawings.

A new section was set up in 1958-59 to handle the design work on the South Saskatchewan River Project, but because of the experienced staff in the Design Division, it was called upon to do a large part of the design engineering for the South Saskatchewan River Project. This work included the testing of concrete conduit models, the location and design of two access roads, the planning of the P.F.R.A. damsite headquarters, the design and structural analysis of the diversion tunnels, and the design of the construction bridge piers.

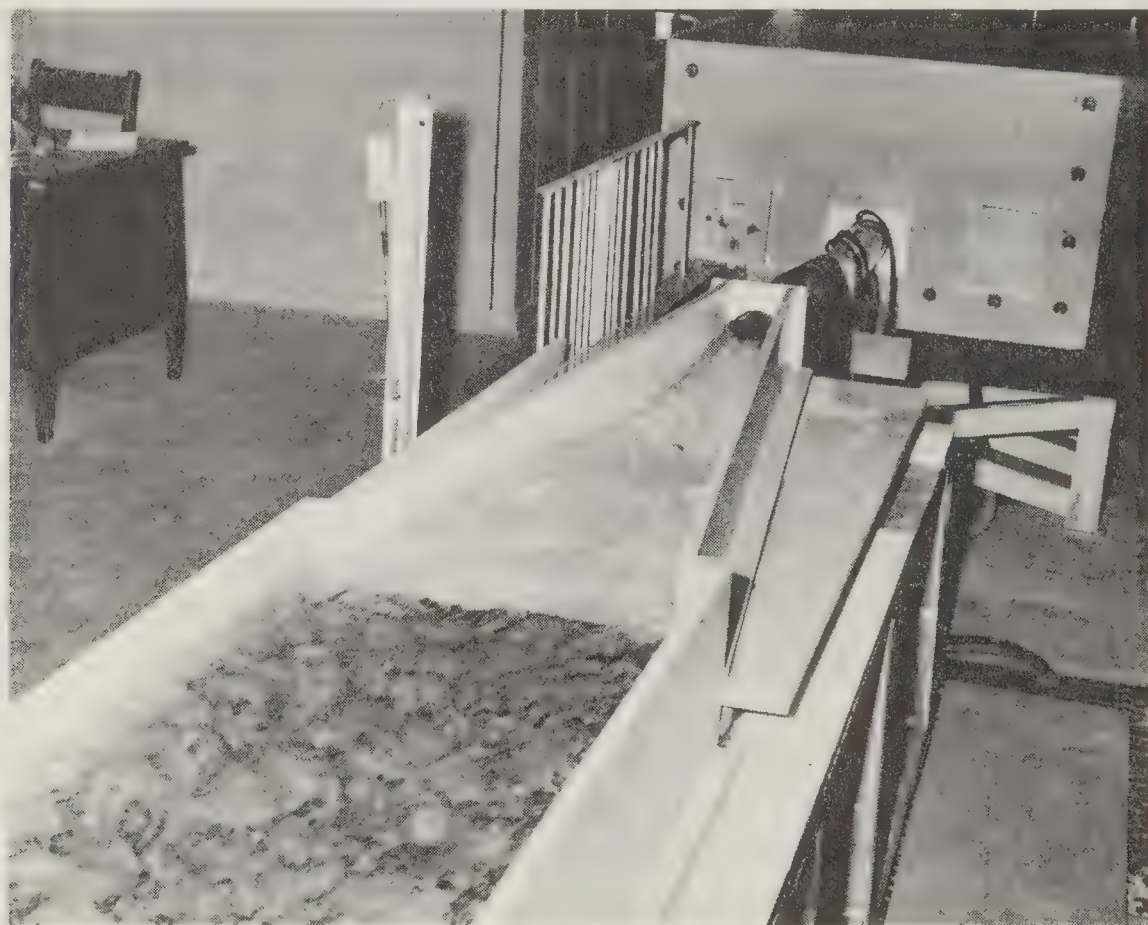
All design engineering work for the Western Block of the Bow River Project north of the main canal was completed in 1958-59, as was the investigational work and preliminary planning on the Sundial and Retlaw Tracts. Plans have been prepared for the first contract on the Sundial lateral.

The Design Division was an active participant in the Co-ordinating and Engineering Committee with the Province of Alberta. All design and investigational work requested by that Committee was carried out during the

year.

Design work was also undertaken for special features of eleven other projects which included headwater controls in Upper Assiniboine River; building and livestock handling units for the Community Pasture Branch, and the engineering, planning and design of irrigation and control structures for the Eastern Irrigation District.

In the Hydraulics Laboratory experimental work was continued on the tunnel outlet works for the South Saskatchewan River Project. In addition, a general hydraulic investigation was made on the diverging type outlet structures.



A model test being run in the P.F.R.A. Hydraulic Laboratory in Regina on a diversion tunnel stilling basin for the South Saskatchewan River Project.

Ref. No. 17806-12

#### SOIL MECHANICS AND MATERIALS DIVISION

The Soil Mechanics and Materials Division is responsible for providing technical advice on the design and maintenance of earth dams, the foundation design of structures, and the use of soils, concrete and other materials for construction purposes. To carry on these functions the Division makes detailed investigations of damsites and foundations, conducts exhaustive laboratory tests, analyzes data, and makes appropriate design studies.



For those projects under construction, control testing of soils, cement and concrete is required, and special test apparatus must often be installed to measure the performance of dams, spillways and conduits. Performance records are kept and special studies are made to provide a guide for the improvement of design and construction procedures.

During 1958-59 preliminary Soil Mechanics Reports were prepared on eleven projects under investigation and twelve special reports on various phases of research and development work. In addition, other special studies were undertaken by the Soil Mechanics Division in 1958-59.

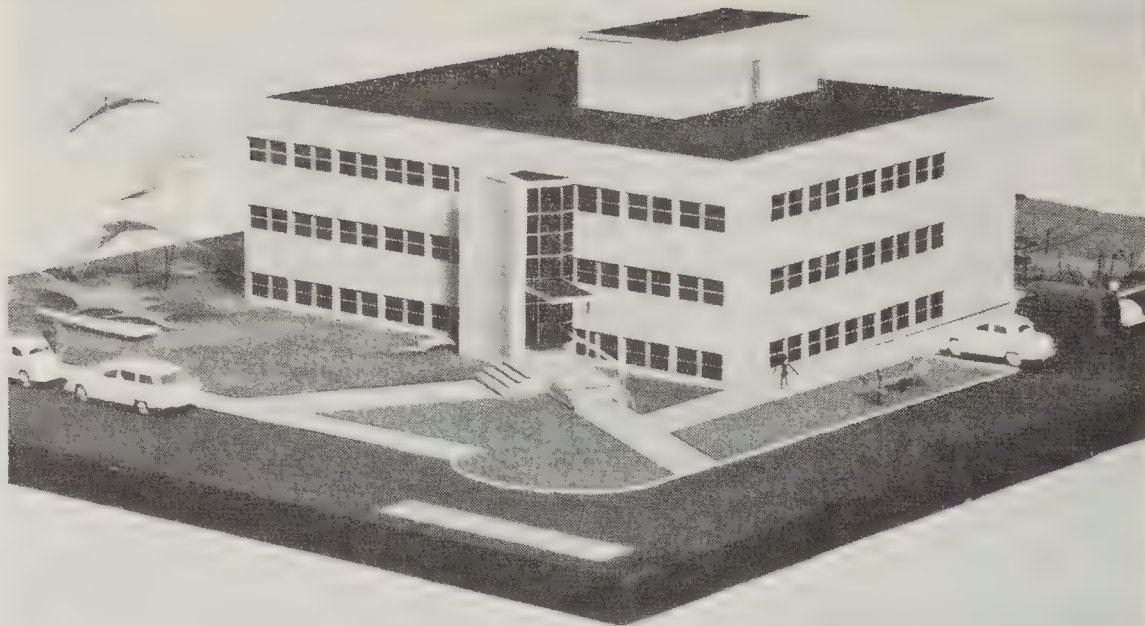
A Concrete Control and Practical Research program was carried out for the evaluation of concrete aggregates and for special studies on practical research problems. The Drilling Department worked on 29 different sites, drilling a total of 66,420 feet and taking 20,115 samples for analysis. The major part of this work was done on the South Saskatchewan River Project. The total footage includes over 10,500 acre feet of holes drilled for foundation grouting at the St. Mary Dam. The Drilling Department also explored potential water supply sources for the South Saskatchewan River Project Construction Headquarters.

The Frost Research program was expanded during the year with studies being conducted at 11 sites to determine the depth of frost penetration, the amount of heave due to frost action and the fluctuations in groundwater levels. Laboratory tests were conducted to measure capillarity and grain size of potential frost heaving soils. Research was also continued on highly plastic clay shales and canal linings.

During the year the Soil Mechanics Division prepared specifications for the Concrete Aggregate Processing Contract and prepared design layout plans for Stage 1 and 2 Embankment Contracts for the South Saskatchewan River Project. The Division reviewed the soil mechanics features of other plans and specifications and provided concrete and earthwork inspection services on contracts let during the winter of 1958-59.

A permanent Soil Mechanics and Materials Building was planned to provide space for the Division. Architectural studies of layout and function were made with the architects who prepared the necessary plans and specifications for the building. Tenders were called in October 1958. The main basement excavation was made and pile foundation installed under the supervision of the Division staff. Construction of the building proper was begun in January 1959 and is expected to be completed in late 1959.

Members of the Division assisted in the program and work associated with the Twelfth Annual Soil Mechanics Conference held in Saskatoon December 8 and 9, 1958. Members of the Division presented two papers to this meeting, one entitled "Test Apparatus in Earth Embankments" and the other "The Proposed South Saskatchewan River Dam". A paper entitled



Model of P.F.R.A. Soil Mechanics Laboratory being constructed on the University of Saskatchewan grounds at Saskatoon.

Ref. No. 16327-2

"Evaluation and selection of Aggregates for Concrete Construction" was prepared and presented at the Annual Convention of the Canadian Good Roads Association, and a paper entitled "Rebound in the Bearpaw Shale, Western Canada" was published by the Geological Society of America.

The Soil Mechanics staff provided technical assistance for the Consulting Board appointed by the Canadian Army to investigate the failure of the Peace River Bridge.

#### AIR PHOTO ANALYSIS AND ENGINEERING GEOLOGY DIVISION

The services of the Air Photo Analysis and Engineering Geology Division consist of providing qualitative and quantitative data from air photos and supplying geologic information to assist in the investigation and design of P.F.R.A. projects. To carry out this work requires a detailed interpretation and analysis of air photos, the compilation of plans by photogrammetric techniques, the maintenance of an air photo library and the preparation of mosaics from air photos. Information relating to the origin and history of valleys, and the engineering properties, origin, and mode of deposition of



geologic materials, is supplied by this Division,

During 1958-59, air photo reconnaissance studies were made on Turtlehead Creek, Wascana Creek, Souris River, Kamsack Creek and Cus-sed Creek to determine possible damsites. Air photo studies along with followup field checks were made on the Turtle Mountain Pasture, Cote-San Clara Pasture and the McCreary Pasture. A report entitled "Big Boggy Creek Accuracy Test" was prepared describing the accuracy of the Balplex photogrammetric plotter using new distortion-free aerial photography. A total of 28 photogrammetric plans were completed showing topography of proposed reservoir areas of selected sites in Manitoba, Saskatchewan and Alberta.

Contracts were let during the year for air photo coverage of the Lower Assiniboine River downstream of Brandon, Manitoba; the Gap Dam-site area on the Old Man River in Alberta, and the reservoir area of the South Saskatchewan River Project. New 1958 photography for the Neepawa Area of Manitoba was obtained through agreement with the Interdepartmental Committee on Air Surveys. One inch to one mile coverage of the delta area of the Saskatchewan River east of The Pas, Manitoba, was purchased from the National Air Photo library and 1958 coverage of the Buffalo Pound Lake was purchased from an air survey company.

In addition to regular township-type mosaics prepared during the year, a mosaic of the entire South Saskatchewan Reservoir area was completed as well as four mosaics covering a portion of the Saskatchewan River Delta area east of The Pas, Manitoba. To assist the new soil survey of Saskatchewan, the Division prepared 509 regular township mosaics in 1958-59.

A new technique is under development by this Division of P. F. R. A. whereby the analysis and interpretation of vegetation, soils, surface geology, land use and drainage are done by photogrammetric means. Working from a stereomodel, it is possible to measure accurately such things as the height of trees, slopes, bank heights, and stream gradients to complement air photo patterns. As a result, a more comprehensive and complete plan is produced.

## HYDROLOGY DIVISION

The Division was established for the purpose of providing basic hydrologic information for the planning, design and operation of P. F. R. A. projects. In addition, the Hydrology Division acts as the Secretariat for the Prairie Provinces Water Board for which it undertakes special studies. It also provides information for the Canadian section of certain International Engineering Boards established under the International Joint Commission.

The Work of the Hydrology Division falls into three categories;

water supply and water utilization studies for the individual projects, flood potential studies for individual projects, and comprehensive studies on a watershed basis.

### Individual Project Studies

Small studies were made to evaluate the water supply or the flood potential or both for twenty-eight projects during the past year.

Office investigation of water supply includes a reconstruction of available hydrometric and meteorological information, an estimate of the water demands which will develop at the project, and a study of the storage requirements necessary to supply a certain demand in a certain area.

Flood potential investigations for small projects are usually restricted to estimates of flood peaks with recurrence intervals of fifty years or less. When hydrometric records are available, a flood frequency curve is prepared for the project in question. To assist in estimating flood potential for areas with no hydrometric data, a comprehensive study of flood frequencies on the prairies has been initiated. The final results of a flood potential study are usually presented in the form of a table indicating the odds in any one year that the flood potential will exceed a calculated flow.

Investigations which are now under way include water supply and flood potential studies for storage sites on Willow Creek in Alberta, reconstruction of levels at Wakaw Lake in Saskatchewan, and others.

### Watershed Studies

During the past year four watershed-type studies were completed in addition to the completion of the series on the Qu'Appelle watershed. The study of water supply and flood potential for the Upper Assiniboine Basin has been completed and the results will appear as Appendix II of the final Assiniboine Report which is being prepared jointly by the Saskatchewan Regional Engineer and the Hydrology Division. The overall study of the Assiniboine Watershed was carried out by the Regional Offices in Saskatchewan and Manitoba assisted by the various divisions of the Engineering Services Branch.

### Miscellaneous

Snow surveys were made in the Upper Qu'Appelle Basin to assist in predicting the runoff volume at Buffalo Pound Lake and also in the Lower Qu'Appelle Basin to provide an index of probable runoff in the area east of Craven. These surveys are carried out in close co-operation with the Manitoba Water Resources office who make a snow survey for the whole Assiniboine

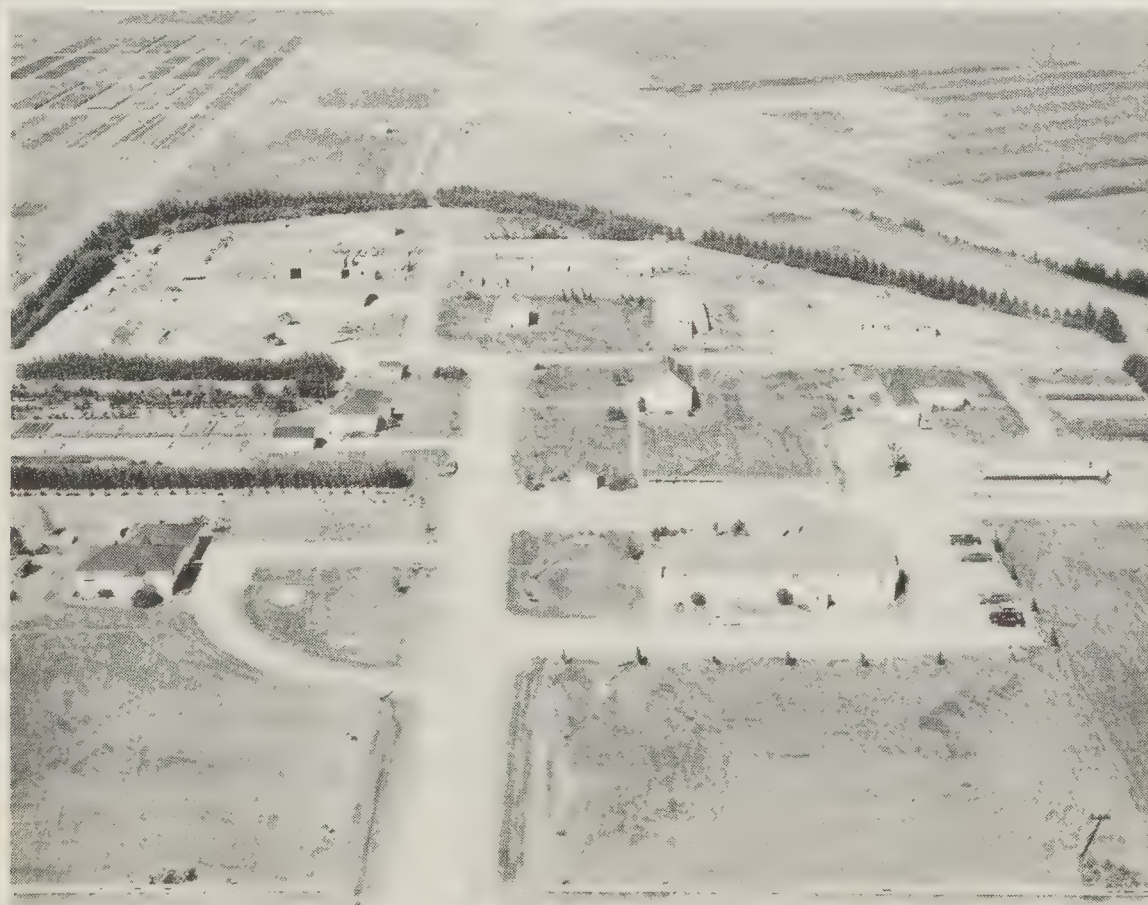


Basin on February 15 and March 15 of each year. As in the past, assistance has been given the Experimental Farm Service in operating the run-off station at Davin. An analysis has been started of the hydrometric records available on the South Saskatchewan River to permit the development of an accurate tailwater rating curve at the Coteau Creek damsite. This analysis will also assist in short term flow prediction for the damsite area.

As Secretariat of the Prairie Provinces Water Board, the Hydrology Division is making a study of the frequency and amount of runoff at any point on the prairies. This will provide information for water studies comparable to the flood information which will be provided by the flood frequency studies.

### DRAINAGE DIVISION

To investigate and find solutions to the drainage and alkali problems which arise under irrigation, P.F.R.A. organized a Drainage Division in 1949. This division works closely with other services in the location of canals, problems associated with canal seepage, and on the location and types of drains for specific soil types. The Drainage Division also carried out continuing water level and salinity investigations on P.F.R.A. irrigation projects in Alberta and Saskatchewan. This division has carried out extensive sampling and analysis of various soil series to evaluate their behavior under irrigation.



Aerial view of the Drainage Division Headquarters,  
Laboratory and test plots at Vauxhall, Alberta.

## Bow River Irrigation Project

### Groundwater Observations

Observation wells installed in the Drain 1 area at Vauxhall in 1957 indicated that due to improved surface drainage the water table was approximately the same or lower than in the previous year and that the tile drains are retaining the water table at a desirable depth in their area of influence. In the Hays area observation wells and piezometers show the groundwater level to be generally lower for the Distributary "U" area and slightly higher in the area adjacent to Lateral "R". With few exceptions, observation wells in the Hays District were dry to 25 feet. Investigations as to effectiveness of tile drains on the Bow River Project were continued with water sampling and discharge measurements being recorded regularly.

### Surveys

Drainage engineering surveys were made to obtain elevations and location of observation wells and piezometers on groundwater studies. Location and construction surveys were completed for an experimental drainage plot at Vauxhall. Miscellaneous surveys included location and level surveys for deep piezometers, soil test holes and tile drain surveys.

Land levelling surveys were completed on 435 acres in the Vauxhall area with detailed levelling plans on 326 acres and check surveys during construction on 129 acres. Dykes and ditches were located on this land if requested. A land levelling, use and yield survey was conducted in August and December 1958.

### Special Investigations

During the year studies were initiated to determine the response of glacial till soils to tile drainage, to observe the effects of shallow and deep tile drainage on salinity control and the prevention of waterlogging in the soil root zone, and to correlate and interpret field data with laboratory analyses as pertaining to leaching and soil amendments such as gypsum.

The greatest amount of salt was removed from the upper 3 feet of the soil profile above the tile drains with the initial application of 17 inches of water. A further application of 30 inches removed most of the remaining salt from the 3 - 6 foot of profile. The higher gypsum content of the soil was considered helpful in maintaining reasonably good permeability to water with leaching.

In 1958 a start was made in determining the magnitude and direction of soil moisture movement at different periods throughout the season. Periodic soil sampling was also carried out to follow the salt movement in



the soil. The effect of leaching, with or without gypsum, on the salt status of the soil was under field and laboratory study during the year.

Dugout investigations were continued in 1958-59 with 12 sites being located for farmers in the Vauxhall area, and 36 sites in the Hays area. The performance of both lined and unlined dugouts was followed throughout the year.

Special studies were conducted in problem areas on the Bow River Project. Detailed soil and drainage studies were conducted and recommendations made by the Drainage Division on these areas.

As measured in other years the salinity of the irrigation water increases from 180 p.p.m. at the Carseland Diversion, to about 400 p.p.m. in Travers Reservoir. There is no appreciable increase beyond this point.

### MAPLE CREEK IRRIGATION PROJECT

Drainage wells drilled and developed prior to 1957 on the Upper and Lower V projects were operated continuously by project personnel from May 1 to October 1. Piezometers at various depths were used to measure their effectiveness in lowering the water table in the surrounding area. Generally the water table was lowered 2 to 9 feet during the pumping period. With a few exceptions, the water table rose during a two-month period after pumping, often as much as 10 feet but about 5 feet on the average. There was no appreciable change in the salt status of the groundwater pumped.

Detailed drilling and soil sampling was carried on in the Maple Creek "Flats" to compare adjacent virgin soil types with similar soils that have been under irrigation for a number of years. The survey indicated that the problem areas are a relatively small percentage of the total area and that they are located mainly on the fringes of the project.

### LAND CLASSIFICATION STUDIES

Studies undertaken during 1957 indicated certain trends of salt movement in various soil series under irrigation as compared with the original dryland. Follow up investigations in 1958 were directed at extending the soil series coverage, and obtaining more detailed information regarding the solonetzic soil series. This information is regarded as essential for the developing of land classification standards.

The Drainage Division co-operated with other members of the Land Classification Committee in a study as to how soils and topography influence yields and net returns. Such studies have shown significant correlation of soils and topography with yields.

## CONSTRUCTION, EQUIPMENT and SUPPLY DIVISION

The Construction, Equipment and Supply Division serves as a co-ordinating and servicing group for many of the operational activities of other branches of P.F.R.A. In this capacity the division employs technicians and tradesmen with a variety of abilities and skills. Equipment is provided to enable these men to undertake many types of work which cannot be conveniently undertaken by local contractors or business establishments, due to the inaccessibility of the area or the character of the work. Materials are procured for many activities and may be processed to finished products or adapted to particular uses as required.

The administration of this Division is centered in Regina headquarters with service units located in Moose Jaw, Vauxhall, Lethbridge and Regina. These units repair and maintain P.F.R.A. equipment and machinery, design and construct new and special types of equipment required by the various branches of P.F.R.A. and serve as storage and distribution centers for the organization.

During 1958 there were 116 field jobs of various sizes undertaken by P.F.R.A. maintenance crews and equipment. These jobs included steel and timber pile driving on several water storage projects, building the irrigation ditches and installing all the timber structures and extensions to the Eastend and Nashlyn irrigation projects; fireguarding in community pastures, repairing or rebuilding concrete spillways and structures; and land levelling and water development projects in community pastures. Several other jobs were done with local machinery and labour and was supervised by members of the maintenance staff. Many other maintenance duties on irrigation projects and community pastures were carried out by operational personnel with the help of equipment provided by the Division. This service made it possible for routine repair work to be done efficiently. Cost records are maintained which provide a gauge for comparison with contract work.

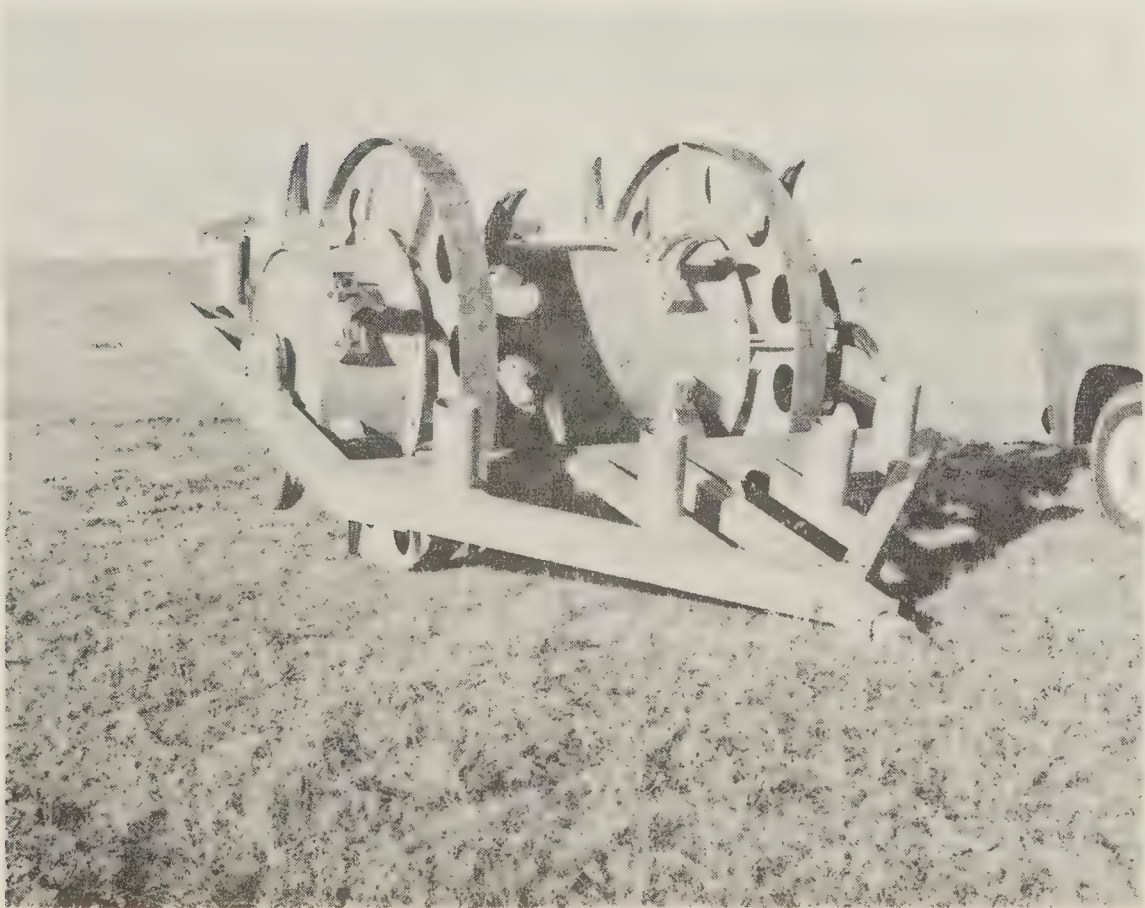
The trade shops overhauled and repaired vehicles, tractors and maintenance equipment. Two special type machines were designed and constructed in 1958; a four-foot diameter steel ball for use in bush clearing operations in the parkland pastures, and a range pitting machine for use in water conservation programs in community pastures. To test models of conduits proposed for the South Saskatchewan River Project, an apparatus was built to apply vertical and horizontal loads simultaneously to the various designs of conduit models.





Four foot ball and chain coupling device constructed by the Moose Jaw service unit. Steel ball weighs four tons.

Ref. No. 16899



Tooth pitter constructed at the Moose Jaw warehouse for deep pitting shown in transport. Wheels are removed when in operation.

Ref. No. 17001

## LAND INVESTIGATION and APPRAISAL DIVISION

The Land Investigation and Appraisal Division of P.F.R.A. is responsible for the acquisition of all land required by P.F.R.A. in carrying out its land and water conservation and reclamation program. The work of the Division involves the investigation, leasing and purchase of lands required for the various projects, road diversions and canals. Land exchanges and recommendations for payment of claims resulting from construction are also handled by this Division. When land is required the procedure followed is to obtain "Right of Entry" or an "Option for Land Purchase" in order that investigations and construction may be undertaken. Land appraisal for negotiation purposes is carried out on all lands required by P.F.R.A. Submissions for authorization to purchase, are based on the appraisal report.

The Land Investigation and Appraisal Division also maintains a record of Registered Survey Plans, Community Pasture Plats, and Titles, Leases and Permits for Land held by P.F.R.A. on behalf of Canada.

As of March 31, 1959, this Division was responsible for the following acreages:-

Water Conservation & Reclamation Projects -			
Saskatchewan and Alberta	77,293.73 ac.		
Manitoba	<u>2,247.26 ac.</u>		79,540.99
Community Pastures (Titles & Leases)			
Saskatchewan	1,537,888.34 ac.		
Manitoba	<u>241,921.19 ac.</u>		1,779,809.53
Major Irrigation Projects			
St. Mary	10,535.02 ac.		
Bow River	129,510.80 ac.		
South Saskatchewan River	<u>3,098.45 ac.</u>		<u>143,144.27</u>
TOTAL ACREAGE			<u><u>2,002,494.79</u></u>

The cost involved for land acquisition during the fiscal year 1958-59 amounted to \$462,591.62.



## PLANNING and INFORMATION DIVISION

The Planning and Information Division was established in 1949 to provide information, library and photographic services to all branches and divisions of P.F.R.A. The principal duty of the Planning and Information Division is to collect and assemble factual information pertaining to the history and development of P.F.R.A. projects for use in the preparation of reports and publications. This Division prepares the P.F.R.A. Annual Report; the reports on P.F.R.A. activities used in the Annual Report of the Minister of Agriculture and the Canada Year Book; monthly reports of activities for the Deputy Minister of Agriculture, and progress and summary reports on current P.F.R.A. projects. It is also involved in preparing and editing material on P.F.R.A. activities used in articles appearing in technical journals, magazines and newspapers; filling requests for information on P.F.R.A. activities from schools, government and private agencies, and research institutions; and carrying out special research assignments as required by the Director or other divisions of P.F.R.A.

A further activity of the section is to be responsible for arranging the program and itinerary of visitors to P.F.R.A. from other parts of Canada and from other countries. During the year a number of visitors were given an opportunity to become familiar with the various phases of rehabilitation and reclamation work carried out by P.F.R.A. In addition to the routine duties, numerous requests from individuals living in all parts of Canada as well as in other Countries, for information on the work and program of P.F.R.A., were handled during the year.

The work of the P.F.R.A. Library in Regina includes the ordering and distribution of books, periodicals, information publications and government documents held by P.F.R.A. either in the library in Regina or in other offices; and the filing of pamphlets, bulletins, reports and books of particular interest in P.F.R.A. work as a ready reference for all members of the organization. The Library also provides an inter-library loaning service to the divisions, branches and offices of P.F.R.A.

During the 1958-59 fiscal year a total of 750 publications were processed through the library, 507 of which were purchased, 183 were obtained free of charge, and 60 were received on loan from other libraries. Approximately 145 periodicals were circulated regularly by the library to interested staff members both in Regina and in field offices. In addition the library looked after the filing and cataloguing of reports and proceedings prepared by the various departments of the organization and retained in the library for reference purposes.

The Photo Section provides photographic services to all divisions

and branches of P. F. R. A. and also to other Federal Government Departments in Regina and Indian Head. It also assumes responsibility for the care of P. F. R. A. photographic equipment, and maintains a complete file of pertinent P. F. R. A. black and white prints, negatives, and color slides.

The quantity of work and the number of services requested in the Photographic Section continued to increase during the past year. Twelve hundred and eleven requests were received for various types of work, resulting in the developing of 409 rolls of film, the printing of 6,109 contact pictures and 30,675 enlargements varying in size from 4" x 5" to 16" x 21" and the copying of 3,193 mosaics, plans and charts. About 2,500 prints and color slides were added to both the print and slide file respectively. The integration of the Manitoba regional office photo files with the Regina headquarter's file was completed during 1958-59.

Following the signing of the Agreement to construct the South Saskatchewan River Project, a large number of requests were filled for publicity prints showing progress of construction on the project. The number of requests for sets of color slides to be used in illustrated talks to agricultural groups increased significantly. During 1958-59, considerable time was spent assembling and organizing 16 mm movie material taken previously. Some additional footage was shot in connection with irrigation and community pasture work. A film on Pasture Improvement operations was completed and a progress film is being taken of construction on the South Saskatchewan River Project.



# APPENDIX I

## WATER DEVELOPMENT PROGRAM

Number of projects and amount of financial assistance paid from 1935 to March 31, 1959

		DUGOUTS			STOCKWATERING DAMS			IRRIGATION SCHEMES			TOTALS	
		Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	
MANITOBA												
Individual	11,434	1,146,977.09	314	23,459.38	167	49,351.34	11,915	1,219,787.81				
Neighbour	56	11,147.84	14	3,683.49	8	2,212.62	78	17,043.95				
Community	6	11,030.86	23	128,169.72	2	30,582.54	31	169,783.12				
Total	11,496	1,169,155.79	351	155,312.59	177	82,146.50	12,024	1,406,614.88				
SASKATCHEWAN												
Individual	31,515	3,521,934.75	4,359	375,927.25	2,199	501,115.78	38,073	4,398,977.78				
Neighbour	278	70,240.32	54	11,690.94	94	39,113.40	426	121,044.66				
Community	282	217,082.34	174	933,683.84	64	619,284.54	520	1,770,050.72				
Total	32,075	3,809,257.41	4,587	1,321,302.03	2,357	1,159,513.72	39,019	6,290,073.16				
ALBERTA												
Individual	5,563	578,728.46	2,289	218,121.08	1,037	246,085.96	8,889	1,042,935.50				
Neighbour	37	10,800.88	13	3,318.10	13	4,231.85	63	18,350.83				
Community	33	41,958.86	104	677,085.82	52	657,824.23	189	1,376,868.91				
Total	5,633	631,488.20	2,406	898,525.00	1,102	908,142.04	9,141	2,438,155.24				
GRAND TOTAL	49,204	5,609,901.40	7,344	2,375,139.62	3,636	2,149,802.26	60,184	10,134,843.28				

## APPENDIX II

### WATER DEVELOPMENT PROGRAM

Progress by Years in the Construction of Individual, Neighbor and Community Projects

Fiscal Yr.	Number of Projects Constructed				Financial Assistance Paid			
	DO	SWD	IRR	TOTAL	DO	SWD	IRR	TOTAL
*1935-45	18,842	4,312	1,004	24,158	1,979,324.48	468,958.53	168,871.84	2,617,154.85
1945-46	4,316	261	28	4,605	489,782.13	27,752.56	4,685.28	522,219.97
1946-47	4,945	199	48	5,192	581,172.05	48,341.75	8,697.82	638,211.62
1947-48	1,804	241	64	2,109	202,443.78	140,601.81	90,715.57	433,761.16
1948-49	1,508	220	77	1,805	171,566.42	319,540.09	365,241.68	856,348.19
1949-50	3,031	164	123	3,318	367,392.80	214,973.66	220,242.50	802,608.96
1950-51	3,442	494	721	4,657	408,385.52	295,594.47	237,892.22	941,872.21
1951-52	478	106	350	934	60,051.14	95,488.30	171,773.19	327,312.63
1952-53	861	119	290	1,270	100,219.54	32,769.41	116,672.07	249,661.02
1953-54	1,791	190	187	2,168	227,372.12	126,415.05	209,287.59	563,074.76
1954-55	1,314	242	193	1,749	161,716.42	201,457.82	122,534.03	485,708.27
1955-56	504	159	114	777	68,141.55	78,443.87	87,547.88	234,133.30
1956-57	863	131	114	1,108	112,268.86	46,272.04	157,803.10	316,344.00
1957-58	2,218	225	155	2,598	268,273.35	143,319.23	90,787.91	502,380.49
1958-59	3,287	281	168	3,736	411,791.24	135,211.03	97,049.58	644,051.85
TOTAL	49,204	7,344	3,636	60,184	5,609,901.40	2,375,139.62	2,149,802.26	10,134,843.28

DO - Dugout

SWD - Stock Watering Dam

IRR - Individual Irrigation Project

\* - Annual figures for accumulated years may be found in previous reports



# APPENDIX III

## COMMUNITY WATER DEVELOPMENT PROJECTS Constructed in 1958

Name of Project	Location	Prov.	Type of Project	Irr. Ac.	Acre Feet	Costs
Abbey	Abbey	Sask.	Stockwatering Dugout	—	1.5	\$ 1,000.00
Airdrie	Calgary	Alta.	Multi-purpose Res.	—	200	9,789.37
Alsask	Alsask	Sask.	Multi-purpose Res.	—	30	9,709.95
Amsterdam	Amsterdam	Sask.	Stockwatering Dugout	—	1.5	955.55
Avlon	Biggar	Sask.	Stockwatering Dugout	—	3	839.50
Bengough	Bengough	Sask.	Stockwatering Dugout	—	1	927.00
Bircham	Calgary	Alta.	Flood Irrigation	1,200	—	8,294.55
Bow Island	Bow Island	Alta.	Stockwatering Dugout	—	1.5	1,000.00
Bratt's Lake	Wilcox	Sask.	Stockwatering Dugout	—	1.5	733.53
Bryn Mawr.	Earl Grey	Sask.	Stockwatering Dugout	—	1.5	997.12
B.T. Grazing Co-op	Hilda	Alta.	Stockwatering Dugout	—	3	1,000.00
Buffalo Valley	Wiseton	Sask.	Stockwatering Dugout	—	1.5	598.00
Chaplin	Chaplin	Sask.	Stockwatering Dugout	—	3	886.08
Claydon	Claydon	Sask.	Irrigation	700	300	3,240.00
Coleville	Coleville	Sask.	Stockwatering Dugout	—	1.5	999.50
Colgate	Colgate	Sask.	Flood Irrigation	320	—	7,110.23
Congress-Stonehenge	Limerick	Sask.	Stockwatering Dugout	—	2	1,000.00
Craigmyle	Craigmyle	Alta.	Multi-purpose Dugout	—	1.5	1,000.00
Crestwynd	Crestwynd	Sask.	Stockwatering Dugout	—	1.5	980.33
Crowfoot	Gleichen	Alta.	Multi-purpose Res.	—	110	3,576.12
Cypress View	Irvine	Alta.	Multi-purpose Res.	—	300	11,336.21
Demaine	Demaine	Sask.	Multi-purpose Dugout	—	1.5	805.00
Dixon Lake	Spring Valley	Sask.	Flood Irrigation	2,500	500	10,146.09
Doddsland	Druid	Sask.	Stockwatering Dugout	—	1.5	999.50
Downey Lake	Maple Creek	Sask.	Stockwatering Dam	—	58	1,404.00

Name of Project	Location	Prov.	Type of Project	Irr. Ac.	Acre Feet	Costs
Dry Coulee	Eastend	Sask.	Stockwatering Dam	—	10	\$ 1,605.30
East Borden Grazing Co-op	Borden	Sask.	Stockwatering	—	60	994.00
East Trout Creek	Stavely	Alta.	Stockwatering Dam	—	8	3,446.40
Ebenezer	Ebenezer	Sask.	Multi-purpose Dugout	—	2	735.76
Egg Lake	Avonhurst	Sask.	Multi-purpose Res.	800	—	5,834.60
Emerald Hill	Milestone	Sask.	Stockwatering	—	250	7,582.15
Excelsior	Rush Lake	Sask.	Stockwatering Dugout	—	1.5	998.24
Fillmore	Fillmore	Sask.	Stockwatering Dugout	—	1.5	1,000.00
Foam Lake (Elfros)	Foam Lake	Sask.	Flood Irrigation	4,000	—	11,964.48
*Freemont	Freemont	Sask.	Stockwatering Dugout	—	2	499.00
Garden Plains	Spondin	Alta.	Stockwatering Dugout	—	6	1,596.00
*Govan	Govan	Sask.	Multi-purpose Dugout	—	1.5	283.34
Granlea	Granlea	Alta.	Multi-purpose Res.	—	725	757.50
Heath Creek	North Fork	Alta.	Stockwatering Dam	—	12	3,848.40
Kyle-Lacadena	Lacadena	Sask.	Stockwatering Dugout	—	2	800.00
Lochend Lake	Calgary	Alta.	Dam & Irrigation	1,600	1,100	7,750.35
MacArthur	Walsh	Alta.	Multi-purpose Res.	—	700	14,105.76
Marienthal	Torquay	Sask.	Stockwatering Dugout	—	1.5	756.00
Michelle Coulee	Thelma	Alta.	Multi-purpose Res.	—	800	13,935.55
Neudorf	Neudorf	Sask.	Multi-purpose	—	—	1,789.76
New Brigden	Hanna	Alta.	Stockwatering Dam	—	60	3,581.53
Ogema	Ogema	Sask.	Stockwatering Dugout	—	1.5	863.36
Orkney	Orkney	Sask.	Stockwatering Dam	—	10	1,982.00
Osburne	Iddesleigh	Alta.	Stockwatering Dam	—	210	6,395.35



Name of Project	Location	Prov.	Type of Project	Irr. Ac.	Acre Feet	Costs
Perdue	Perdue	Sask.	Stockwatering Dugout	—	1.5	\$ 854.00
Rose Glen Water Users	Schuler	Alta.	Multi-purpose Dam	200	150	6,884.15
Saline	Invermay	Sask.	Multi-purpose Res.	1,000	—	2,376.60
Scotsguard	Shaunavon	Sask.	Stockwatering Dugout	—	3	1,857.00
Sintaluta	Sintaluta	Sask.	Stockwatering Dugout	—	1.5	997.50
Spruce Coulee	Elkwater	Alta.	Multi-purpose Res.	—	1,000	5,640.71
Spy Hill	Spy Hill	Sask.	Stockwatering Dugout	—	1.5	792.93
St. Jean Baptiste	St. Jean Baptiste	Man.	Multi-purpose Dugout	—	1.5	999.00
Tatagwa Lake	Weyburn	Sask.	Flood Irrigation	10,000	—	28,840.44
Tilney	Tilney	Sask.	Multi-purpose Res.	—	100	8,308.32
Two Lakes	Elkwater	Alta.	Multi-purpose Res.	1,500	1,900	14,378.12
Valley Centre	Bents	Sask.	Stockwatering Dugout	—	1.5	984.85
Verwood	Verwood	Sask.	Stockwatering Dam	—	16	1,414.00
Vonda	Vonda	Sask.	Multi-purpose Dugout	—	2	925.00
Wakaw	Wakaw	Sask.	Stockwatering Dugout	—	1.5	996.25
Weed Creek	Broadview	Sask.	Flood Irrigation	2,000	—	3,099.45
White Gull Lake	Gull Lake	Sask.	Flood Irrigation	263	—	1,743.00
Wilkie	Wilkie	Sask.	Stockwatering Dugout	—	1.5	999.50

\* — Govan ) Incomplete  
Freemont )

# APPENDIX IV

## LARGE WATER DEVELOPMENT PROJECTS Constructed 1935 to March 31, 1959

Name of Project	Location	Prov.	Type of Project	Completed	Irr. Ac.	Acre Ft.	Costs
Adair Creek Dam	Wolseley	Sask.	Multi-purpose	1956	40	350	\$ 59,849.00
Adam's Lake	Battle Creek	Sask.	Irrigation	1936	1,500	2,000	8,831.00
Aetna Irrigation District	Aetna	Alta.	Irrigation	1947	8,000	—	82,004.00
Atlee Gas Well No. 1	Atlee	Alta.	Irrigation (pump)	1939	7,000	—	12,423.00
Atlee Gas Well No. 2	Atlee	Alta.	Irrigation (pump)	1939	—	—	14,300.00
Bartman Dam	Cessford	Alta.	Irr. & Stockwatering	1943	1,000	3,000	49,100.00
Battleford	North Battleford	Sask.	Irrigation (pump)	1941	800	—	3,058.00
Bedford Slough	Medicine Hat	Alta.	Irrigation	Incomplete	3,000	200	35,493.00
Big Arm Storage	Liberty	Sask.	Irr. & Stockwatering	1939	5,000	5,200	13,161.00
Boissevain	Boissevain	Man.	Storage	1954	—	580	29,992.00
Brown Hill Dam	Grenfell	Sask.	Multi-purpose Res.	1958	—	275	99,394.00
Buffalo Pound	Qu'Appelle Valley	Sask.	Irr. & Stockwatering	1940	x	—	83,723.00
Bullshead Creek	Medicine Hat	Alta.	Irr. & Stockwatering	1940	800	1,130	8,170.00
Canada Land & Irrig. Co.	Medicine Hat	Alta.	Irrigation	1936	45,000	—	80,000.00
Canora	Canora	Sask.	Storage	1941	—	300	16,128.00
Caron	Caron	Sask.	Storage	1948	—	100	17,109.00
Caron Water Development	Thunder Creek	Sask.	Storage & Stockwatering	1944	—	43,500	710,433.00
Consul-Vidora Irrig.	Vidora	Sask.	Irrigation	1950	3,000	—	62,500.00
Craven Dam	Qu'Appelle Valley	Sask.	Irr. & Stockwatering	1943	x	—	33,675.00
Crooked & Round Lakes	Qu'Appelle Valley	Sask.	Irr. & Water Control	1941	x	—	48,650.00
Cypress Storage Reservoir	Ravenscrag	Sask.	Storage for Irrig.	1939	20,000	80,000	467,691.00
Davidson Dam	Davidson	Sask.	Irr. & Stockwatering	1937	100	277	3,114.00
Deadfish Creek	Cessford	Alta.	Irrigation	1949	4,000	5,000	47,832.00
Dead Lake	Macoun	Sask.	Irr. & Stockwatering	1941	—	—	17,528.00
Dunn & Watt	Mankota	Sask.	Irrigation	1937	305	—	2,996.00



Name of Project	Location	Prov.	Type of Project	Comp.			Costs
				leted	Irr. Ac.	Acre Ft.	
Eastend	Eastend	Sask.	Irrigation	1939	4,000	1,300	\$161,682.00
Eastern Irrig. District	Brooks	Alta.	Irrigation	1937	2,280	22,000	22,490.00
Echo Lake	Qu'Appelle Valley	Sask.	Irrigation	1943	x	-	41,753.00
Eureka Irrig. District	Grassy Lake	Alta.	Irrigation	1949	12,000	1,000	38,568.00
Fairy Hill	Qu'Appelle Valley	Sask.	Irr. & Water Control	1941	x	-	4,302.00
Graham Creek	Calgary	Alta.	Stockwatering	1943	-	230	8,529.00
Gouverneur Dam	Ponteix	Sask.	Irrigation	1952	6,000	10,000	242,468.00
Hugonard Dam	Lebret	Sask.	Multi-purpose Res.	1956	100	400	64,231.00
Kaposvar Creek	Melville	Sask.	Stockwatering	1954	-	1,400	102,747.00
Katepwa Weir	Qu'Appelle Valley	Sask.	Irr. & Water Control	1957	-	-	61,192.00
Killarney Dam	Killarney	Man.	Multi-purpose Res.	1956	-	800	41,965.00
Kisbey Flats	Kisbey	Sask.	Irrigation	1939	2,300	5,000	23,211.00
Lafleche Dam	Lafleche	Sask.	Multi-purpose Res.	1957	15,000	30,120	627,922.08
Lajord	Lajord	Sask.	Flood Control	1936	-	300	13,800.00
Lake of the Rivers	Assiniboia	Sask.	Stockwatering	1938	-	300	10,805.00
Larsen Dam	Radville	Sask.	Multi-purpose Res.	1957	-	500	36,437.00
LaSalle River Dams	LaSalle	Man.	Stockwatering	1941	-	900	22,989.00
Last Mountain Lake	Qu'Appelle Valley	Sask.	Irr. & Water Control	1941	x	-	42,721.00
*Leavitt Irrigation	Mountain View	Alta.	Irrigation	1939	7,000	7,050	65,578.00
Lebret	Qu'Appelle Valley	Sask.	Irr. & Water Control	1941	x	-	16,307.00
Little Manitou Lake	Watrous	Sask.	Diversion Canal	1957	-	-	39,271.00
Long Creek No. 1	Estevan	Sask.	Stockwatering	1938	-	137	8,729.00
Long Creek No. 2	Estevan	Sask.	Stockwatering	1938	-	90	8,701.00
McCraney, R.M. of	Kenaston	Sask.	Stockwatering	1937	-	350	1,896.00
*Magrath	Magrath	Alta.	Irrigation	1939	4,000	-	2,756.00
Maple Creek	Maple Creek	Sask.	Irrigation	1938	10,000	23,260	356,179.00

Name of Project	Location	Prov.	Type of Project	Completed	Irr. Ac.	Acre Ft.	Costs
Mary Jane Storage	Manitou	Man.	Multi-purpose Res.	Incomplete	—	1,150	\$ 47,964.00
Middle Creek	Battle Creek	Sask.	Irrigation	1937	1,000	20,000	18,663.00
Minnedosa Dam	Minnedosa	Man.	Storage	1950	20	1,500	105,051.00
Moose Jaw Creek	Lang	Sask.	Irrigation	1938	2,250	2,180	7,618.00
Moose Mountain	Corning	Sask.	Irrigation	1937	—	8,000	14,829.00
Morden Dam	Morden	Man.	Irr. & Stockwatering	1941	100	1,200	344,274.00
Mountain View	Mountain View	Alta.	Storage	1936	—	4,200	3,000.00
Oak Lake	Oak Lake	Man.	Irrigation	1956	13,000	—	119,205.00
Oxbow Dam	Oxbow	Sask.	Irr. & Stockwatering	1941	3,900	3,200	17,436.00
Pipestone Lake	Broadview	Sask.	Stockwatering	1938	—	1,600	11,785.00
*Raymond	Raymond	Alta.	Irrigation	1943	3,000	1,600	6,000.00
Richardson-McKinnon	Consul	Sask.	Irrigation	1946	3,000	—	53,913.00
Rock Lake Reservoir	Brooks	Alta.	Irrigation	1957	11,000	—	133,984.00
*Rolling Hills	Rolling Hills	Alta.	Irrigation	1938	25,000	—	46,839.00
Roughbark Creek	Goodwater	Sask.	Stockwatering	1937	—	1,500	9,314.00
Roseau River Dam	Dominion City	Man.	Multi-purpose Res.	1957	—	—	54,705.00
Rosthern Water Storage	Rosthern	Sask.	Storage	1958	—	160	22,613.00
Russell Creek	Pambrun	Sask.	Irrigation	1951	1,000	2,000	66,493.00
St. Malo Dam	St. Malo	Man.	Multi-purpose Res.	1958	—	1,770	248,937.00
Saskatoon	Saskatoon	Sask.	Storage	1940	—	1,200	290,446.00
Seven Persons	Seven Persons	Alta.	Stockwatering	1943	—	800	12,103.00
Souris-Estevan	Estevan	Sask.	Irr. & Stockwatering	1941	—	—	91,133.00
Souris River	Weyburn	Sask.	Flood Control	1948	—	—	11,998.00
Souris, Town of	Souris	Man.	Stockwatering	1935	—	150	3,841.00
Swift Current	Swift Current	Sask.	Irrigation	1946	30,000	95,000	816,472.00
Tantallon	Tantallon	Sask.	Stockwatering	1942	—	—	2,790.00



Name of Project	Location	Prov.	Type of Project	Completed	Irr. Ac.	Acre Ft.	Costs
Thunder Creek	Kettlehut	Sask.	Flood Irrigation	1948	—	—	\$ 27,204.00
Val Marie	Val Marie	Sask.	Irrigation	1937	5,920	7,000	214,558.00
Val Marie West	Val Marie	Sask.	Irrigation	1940	4,230	2,000	150,639.00
Valeport Dyke	Valeport	Sask.	Flood Irrigation	1958	1,500	—	139,748.00
Wawanesa Dam	Wawanesa	Man.	Irr. & Stockwatering	1941	—	—	125,332.00
Weyburn	Weyburn	Sask.	Flood Irrigation	1940	—	4,000	51,311.00
Wild Horse Storage	Cressday	Alta.	Irrigation	1936	3,600	4,500	24,370.00
Wood River Development	Coderre and Gravelbourg	Sask.	Stockwatering	1942	—	4,923	33,738.00

\* — P.F.R.A. gave assistance to a project already in existence to improve storage capacities, canals and distribution systems.

x — Ultimate irrigation development for all projects along Qu'Appelle River Valley 30,000 — (total storage capacity — 95,600 acre feet).

APPENDIX V  
CUMULATIVE STATEMENT  
Development and Operation of Community Pastures under the  
Prairie Farm Rehabilitation Act  
1938 to March 31, 1959

Fiscal Year	No. of Pasture Units in Operation	Area of Land in Pastures (acres)	Total Cost of Construction of Pastures \$	Livestock Units Carried on Pastures	Acres* per Unit of Live-stock	Cost of Operation Revenue \$	Operating Costs \$	Net Operating Cost per Unit of Livestock \$	Average Charge per Unit Live-stock to Farmers \$
1938-39	14	189,800	165,995.03	3,231	58.7	6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1	21,632.71	20,945.84	1.82	1.88
1940-41	35	884,500	1,004,305.91	23,245	38.1	43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2	65,434.89	50,607.22	1.52	1.97
1942-43	45	1,261,100	1,129,487.54	51,127	24.7	98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3	111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,669,012.21	59,997	22.3	151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1	167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6	198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4	203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1	204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5	211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1	221,129.45	217,867.15	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4	335,327.16	237,742.13	3.08	4.34
1952-53	59	1,652,020	3,754,098.41	94,137	17.5	438,513.75	373,737.36	3.97	4.66
1953-54	60	1,678,736	3,963,572.83	109,583	15.3	507,179.14	490,807.89	4.48	4.55
1954-55	60	1,696,900	4,273,916.79	106,322	15.9	496,805.78	466,153.69	4.38	4.66
1955-56	60	1,728,700	4,509,668.59	108,499	15.8	499,045.13	501,540.73	4.67	4.60
1956-57	61	1,759,570	4,832,863.47	117,441	14.9	548,601.01	508,002.83	4.33	4.67
1957-58	61	1,796,275	5,119,317.01	119,398	15.0	552,938.40	607,129.23	5.08	4.63
1958-59	62	1,815,265	5,509,958.43	117,032	15.5	542,606.90	686,448.88	5.87	4.64
						5,642,558.62	5,302,218.01		

\* - A livestock unit indicates one head of cattle, one horse, or five sheep.  
A pasture unit may include one or more pastures, but it is operated under one management.



APPENDIX VI

P.F.R.A. COMMUNITY PASTURES IN OPERATION DURING THE FISCAL YEAR ENDED MARCH 31, 1959

Community Pasture & Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1958	Accumulated Cost of Construction March 31, 1959	1958-1959	
				Cattle	Horses
SASKATCHEWAN					
Pasture Units					
Coalfields #4, North Portal	32,380	148,740.78	156,091.66	2,624	220
Estevan-Cambria #5-6, Macoun	6,720	18,168.68	18,168.68	486	10
Masefield #17, Orkney	34,880	100,391.42	101,739.39	1,494	4
Lone Tree #18, Bracken	33,600	93,571.92	96,466.71	2,229	62
Battle Creek #20, Divide	66,880	115,233.66	131,504.61	2,511	37
Nashlyn #21, Consul	61,520	86,554.86	87,867.36	2,269	3
Govenlock #22, Govenlock	68,800	106,567.04	108,454.45	2,069	10
Lomond #37, Pasture #1, Goodwater	23,360	80,189.72	81,082.37	2,899	44
Lomond #37, Pasture #3, Maxim	18,400	71,340.38	77,448.68	1,629	23
Laurier #38, Lomond #37 - #2, Radville	37,175	89,838.71	106,043.98	2,636	52
The Gap #39, Hardy	13,920	84,274.31	84,564.76	1,244	48
Val Marie #47, Val Marie	156,320	257,958.21	267,268.77	7,442	17
Beaver Valley #47A, Val Marie	11,360	25,445.11	25,810.86	616	-
Reno #51, Pasture #1, Robsart	17,120	61,202.89	61,733.54	1,224	18
Reno #51, Pasture #2, Consul	11,360	28,814.38	29,234.38	704	-
Tecumseh #65, Forget	18,400	67,377.91	77,298.59	2,018	26
Brokenshell #68, Pasture #1, Yellow Grass	22,720	69,324.89	95,390.20	1,799	64
Brokenshell #68, Pasture #2, Weyburn	8,160	14,818.47	15,458.47	400	7
Excel-Key West #71-70, Ormiston	30,740	90,871.62	96,260.44	2,551	10
Auvergne-Wise Creek #76-77, Ponteix	42,880	140,173.86	140,328.90	3,255	1
Wellington #97, Tyvan	25,360	103,541.09	111,148.25	3,413	52
Caledonia-Elmsthorpe #99-100, Milestone	26,400	116,307.87	118,692.02	2,173	62
Shamrock #134, Shamrock	26,080	82,798.39	86,319.76	1,682	38
Swift Current-Webb #137-8, Beverly	18,720	81,878.71	81,878.71	1,502	46
Gull Lake #139, Tompkins	10,720	32,362.21	32,362.21	542	-

Community Pasture and Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1958	Accumulated Cost of Construction March 31, 1959	1958-1959	
				Cattle	Horses
SASKATCHEWAN - (Cont'd.)					
Pasture Units					
Big Stick #141, Maple Creek	18,160	44,197.75	44,197.75	1,518	-
Bitter Lake #142, Maple Creek	47,410	118,504.20	119,809.80	2,797	-
Spy Hill #152, Welby (Operated in conjunction with Ellice, Manitoba)	19,570	51,696.15	55,322.52	2,157	30
Elbow #223-4, Elbow	30,080	80,242.45	80,810.89	2,141	48
Beaver Hills #245-6, Homefield P.O.	44,160	115,111.64	118,069.01	3,147	151
Willner #253, Rosemae, P.O.	13,280	80,646.25	81,709.05	1,661	-
Coteau #255, Birsay	27,520	62,818.09	64,191.82	1,478	21
Monet #257, Elrose	46,840	111,055.85	111,548.24	2,908	29
Fairview #258, Rosetown	17,000	114,620.21	115,260.23	1,041	8
Newcombe #260, Glidden	52,960	164,069.32	167,020.63	3,282	22
Mantario #262, Empress, Alta.	24,960	69,706.80	70,406.80	1,658	-
Cote	10,080	-	41,609.23	-	-
Mount Hope-Prairie Rose #279-309	31,540	61,202.77	98,440.84	1,867	-
Wreford #280, Hatfield	13,440	79,731.84	81,055.40	1,143	-
McCraney #282, Davidson	10,720	69,677.74	69,677.74	1,195	-
Rudy-Rosedale #284-3, Broderick	19,200	88,333.45	90,057.21	1,663	64
Hillsburgh #289, Brock	13,600	55,439.48	56,439.48	1,017	-
Eagle Lake #289-319, Netherhill	23,250	83,830.94	91,445.69	1,068	6
Kindersley-Elma #290-1, Smiley	21,400	112,394.62	112,394.62	1,886	27
Usborne #310, Venn	12,680	41,680.54	46,018.57	1,052	-
Dundurn #314, Dundurn	44,840	111,080.89	113,477.54	2,184	-
Montrose #315, Donavon	20,480	64,591.49	67,005.91	1,143	-
Oakdale #320, Beaufield	20,800	60,512.93	62,470.08	1,438	14
Antelope Park #322, Hoosier	34,320	102,107.61	106,910.60	2,655	57
Wolverine #340, Plunkett	17,280	68,920.05	73,320.05	1,928	-
Mariposa #350, Kerrobert	26,880	88,617.34	93,370.29	1,756	48
Progress #351, Kerrobert	19,680	65,149.48	65,149.48	1,378	-



Community Pasture and Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1958	Accumulated Cost of Construction March 31, 1959	1958-1959	
				Cattle	Horses
SASKATCHEWAN - (Cont'd.)					
Pasture Units					
Heart's Hill # 352, Compeer, Alta.	15,100	57,845.02	58,931.77	1,544	1
Park # 375, Langham	7,040	22,633.89	22,633.89	362	-
Battle River-Cutknife # 438-9, Gallivan	30,480	86,009.64	86,009.64	1,388	33
Royal # 465, Marcelin	65,120	197,087.61	213,512.64	1,973	37
Paynton # 470, Paynton	23,840	76,293.58	79,542.32	1,198	20
Totals for Saskatchewan		4,773,556.71	5,046,437.48	105,037	1,470
Special Project - Bitter Lake Irrigation included in Bitter Lake Pasture					
MANITOBA					
Pasture Units					
Ellice Pasture, Welby, Sask. (operated in conjunction with Spy Hill #152)	20,320	28,746.37	28,746.37	-	-
Archie Pasture, Welwyn, Sask.	39,740	92,063.11	92,093.20	1,018	18
Portage Pasture, Poplar Point	14,640	44,793.85	44,793.85	1,952	43
Woodlands Pasture, Poplar Point	20,960	68,647.13	69,793.13	2,272	55
Lakeview Pasture, Langruth	29,280	80,724.71	80,724.71	1,805	4
Westbourne Pasture, Gladstone	11,520	40,338.67	42,592.62	1,512	15
Langford Pasture, Neepawa	19,680	70,446.46	71,097.44	1,804	27
Wallace Pasture, Elkhorn	3,280	(Operated by R.M. Wallace)			
San Clara	8,160	-	33,679.63	-	-
Totals for Manitoba		425,760.30	463,520.95	10,363	162
GRAND TOTALS		5,119,317.01	5,509,958.43	115,400	1,632

# APPENDIX VII

## MAJOR PROJECTS - IRRIGATION RECLAMATION

(Projects by Special Votes of Parliament, Administered by P.F.R.A., to March 31, 1959)

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
MANITOBA						
Assiniboine River Diking & Cut Off	Brandon	River Control	Incomplete	-	-	\$ 987,370.00
North-West Escarpment Reclamation Proj.-Riding Mtn. Area	Dauphin	Watershed Control	Incomplete	-	-	980,573.00
Saskatchewan River Reclamation - Pasquia Area	The Pas	Reclamation	Incomplete	135,000	-	2,108,796.00
ALBERTA						
Bow River	Medicine Hat	Irrigation	Incomplete	235,000	408,862	54,398.00
(a) Purchase of Canada Land & Irrigation Company						2,353,182.00
(b) Development & Construction						20,239,827.00
St. Mary	Lethbridge	Irrigation	Incomplete	510,000	320,000	13,597,996.00
Belly River Diversion	Lethbridge	Irrigation	1950	-	-	53,901.00
BRITISH COLUMBIA						
Cawston Benches	Keremeos	Irrigation (pump)	1951	629	2,000	185,491.00
Chase & Johnston - Western Canada Ranching	Kamloops	Irrigation	1951	755	-	98,243.00
Western Canada Ranching #2	Kamloops	Irrigation (pump)	1950	54	-	58,069.00
Lillooet - Pemberton	Pemberton	River Control	1953	-	-	1,056,539.00
South Thompson - Miskinlith Gravity Project	Kamloops	Irrigation	Incomplete	1,030	1,200	12,282.00
Westbank Project	Kelowna	Irrigation	1950	1,200	2,500	537,450.00
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	-	32,229.00
Penticton West Bench	Penticton	Irrigation (pump)	1953	800	-	66,362.00
B.C. Fruitlands	Kamloops	Irrigation	Incomplete	2,000	-	175,761.00

(Above includes ONLY Construction Costs)



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
South Saskatchewan River Project	SASKATCHEWAN					
	Outlook	Multi-purpose	Incomplete	500,000	-	807,910.00
	(Above includes ONLY Construction Costs)					

APPENDIX VIII  
PRAIRIE FARM REHABILITATION ACT - EXPENDITURE BY ACTIVITIES  
April 1, 1935 - March 31, 1959

	1935-1958	1958-1959	Total
<b>ADMINISTRATION</b>			
Ottawa Administration	(a) 338,462	33,254	371,716
Pegina Administration	(b) 1,487,753	157,231	1,644,984
Total	1,826,215	190,485	2,016,700
<b>EQUIPMENT</b>			
Purchase of Equipment	(k) 1,490,524	186,668	1,677,192
Upkeep of Equipment	(k) 990,779	107,695	1,107,474
Equipment Depot	2,209,660	317,031	2,526,691
Total	4,699,963	611,394	5,311,357
<b>LAND UTILIZATION</b>			
Supervision	684,729	50,426	735,155
Construction of Community Pastures	7,379,895	583,165	7,963,060
Pasture Improvements	463,795	99,228	563,023
Operation of Community Pastures	5,037,129	734,889	5,772,018
Purchase of Bulls	649,520	41,985	691,505
Re-establishment of Farmers	(m) -	-	-
Grass Seeding & Experimental Regrassing	710,651	28,276	738,927
Total	14,925,719	1,537,969	16,463,688
<b>WATER DEVELOPMENT</b>			
Supervision	804,764	20,067	824,831
Small Projects including Engineering	16,684,461	1,195,483	17,879,944
Large Irrigation and Storage Projects			
Supervision	(d) 1,856,774	73,804	1,930,578
Construction and Improvements	(c&e) 8,641,291	534,611	9,175,902
Maintenance and Operation	6,209,576	347,968	6,557,544
Re-establishment of Farmers	(n) 216,229	6,308	222,537
Surveys and Explorations	(f&h) 1,660,484	-	1,660,484
Purchase of Land	751,992	12,552	764,544
Total	36,825,571	2,190,793	39,016,364
Cultural work for soil drifting control and related problems prior to April 1, 1946 (under administration of Experimental Farms Service).	4,966,394		4,966,394
GRAND TOTAL	63,243,862	4,530,641	67,774,503



# SPECIAL VOTES UNDER P.F.R.A. ADMINISTRATION

	<u>1935-1958</u>	<u>1958-1959</u>	<u>Total</u>
Assiniboine and Qu'Appelle Rivers, Surveys and Construction	1,028,775	117,909	1,146,684
Lillooet Project B.C. Construction & Exploration	1,170,133	—	1,170,133
Land Reclamation & Development in B.C. (j)	1,940,049	175,761	2,115,810
St. Mary Irrigation Project — Alberta (i)	19,335,215	874,199	20,209,414
Bow River Project — Alberta	25,648,574	1,408,207	27,056,781
Red Deer River Project — Alberta (g)	971,768	75,293	1,047,061
Rivers Dam — Manitoba	22,855	421,581	444,436
Other Miscellaneous Projects — Construction	210,392	—	210,392
Soil Mechanics Building	—	103,769	103,769
Land Protection & Reclamation — Manitoba	2,862,682	255,462	3,118,144
South Saskatchewan River Project — Saskatchewan (g)	4,393,439	1,503,901	5,897,340
Buffalo Pound Project — Saskatchewan	1,656,300	161,874	1,818,174
Surveys and Engineering Costs (i)	10,523,317	1,705,815	12,229,132
GRAND TOTAL	<u>69,763,499</u>	<u>6,803,771</u>	<u>76,567,270</u>

- (a) Included in Cultural Administration to March 31, 1938.
- (b) Included in Water Development Administration to March 31, 1938.
- (c) Includes \$388,923.57 expended under the Supplementary Public Works Construction Act, 1935.
- (d) Includes \$95,198.65 expended on St. Mary River Project (administration) in 1946-47.
- (e) Includes \$300,879.29 expended on St. Mary River Project (construction) in 1946-47.
- (f) Includes \$147,530.22 expended on St. Mary River Project (administration) in 1947-48.
- (g) The amounts shown include Red Deer \$325,642 and South Saskatchewan \$370,093 provided by Department of Reconstruction. In addition, the following amounts were paid from P.F.R.A. Vote: South Saskatchewan — \$59,568; Red Deer — \$33,207.
- (h) General Survey charges now being paid from other P.F.R.A. Votes.
- (i) Amounts shown in Notes (d), (e) and (f) to be added to this total.
- (j) Veterans' Land Act expenditure not included.
- (k) Expenditures until 1949-50 included under Land Utilization and Water Development.
- (l) Previously under P.F.R.A. Vote (see item (g)).
- (m) Re-establishment of Farmers now under Water Development.
- (n) Previously under Land Utilization (see item (m)).

APPENDIX IX  
EXPENDITURES BY PROVINCES  
Prairie Farm Rehabilitation Act and Special Votes under its Administration  
April 1, 1935 — March 31, 1959

	<u>Manitoba</u>	<u>Saskatchewan</u>	<u>Alberta</u>	<u>British Columbia</u>
P.F.R.A.	5,464,645	49,789,652	8,027,676	
Major Irrigation and Reclamation in the Prairie Provinces	469,386	7,914,985	48,074,602	
Land Reclamation, Construction and Development in B.C.				3,285,487
Land Protection and Reclamation	3,118,144			
Assiniboine and Qu'Appelle Rivers	1,053,976	92,708		
Surveys and Engineering Costs	1,926,908	6,446,479	4,032,110	152,487
Administration	<u>343,006</u>	<u>2,128,864</u>	<u>1,885,723</u>	<u>134,935</u>
	<u>12,376,065</u>	<u>66,372,688</u>	<u>62,020,111</u>	<u>3,572,909</u>
				<u>144,341,773</u>

REVENUE

Revenue Received from Projects under P.F.R.A. Office  
to March 31, 1959

Pasture Operation and General Revenue	5,931,074
Irrigation Project Operation (Under P.F.R.A. Vote)	669,083
Irrigation and General Revenue (Major Projects Vote)	<u>2,198,498</u>
TOTAL	<u>8,798,655</u>



APPENDIX X

TOTAL IRRIGATION DEVELOPMENT - ALBERTA AND SASKATCHEWAN

Project	Year Started	Irrigable Acreage		Major Reservoirs	(Live Storage (Acre Feet))	
		Present	Ultimate		Present	Ultimate
<u>Mountain &amp; Foothill Region</u>						
United Irrigation District	1921	34,000	34,000	Driggs Lake	7,500	7,500
Mountain View Irrigation Dist.	1925	3,600	3,600			
Leavitt Irrig. District	1943	4,600	4,600			
Aetna Irrig. District	1943	8,300	8,300			
Macleod Irrig. District	1948	3,500	3,500			
Other		12,300	32,700			
		66,300	86,700			
Total						
<u>Western Prairie Region</u>						
<u>St. Mary-Milk River Project</u>						
	1901	318,200	510,000	St. Mary Reservoir	270,000	270,000
				Chin	50,000	150,000
				Jensen	14,000	14,000
				Ridge	80,000	80,000
				Verdigris	-	110,000
				Waterton	-	130,000
				Lake McGregor	150,000	250,000
	1918	131,000	240,000	Travers	100,000	100,000
Bow River Irrig. Project				Little Bow	12,000	12,000
				Chestermere	3,000	3,000
Western Irrig. District	1908	50,000	50,000	Lake Newell	90,000	100,000
Eastern Irrig. District	1914	200,000	281,000	Rock Lake	11,000	11,000
				Crawling Valley	-	120,000
				Keho	40,000	40,000
Lethbridge Northern Irrig. Dis.	1922	96,100	96,100	Berry Creek Reservoir	30,000	30,000
Berry Creek Project	1938	3,000	8,000	Ardley Reservoir	-	300,000
Red Deer Irrig. Proj.	-	-	300,000	Buffalo Lake	-	300,000
				Craig & Hamilton	-	250,000
Other		52,000	201,000			
		850,300	1,686,100			
Total						

Project	Year Started	Irrigable Acreage		Major Reservoirs	(Live Storage (Acre Feet))	
		Present	Ultimate Proposals		Present	Ultimate
<u>Central Prairie Region</u>						
French Flats-Valley Park	1949	700	6,000			
South Sask. Irrig. Proj.	-	-	470,000	South Sask. Reservoir	-	3,100,000
				Delisle Reservoir	-	25,000
Red Deer Extension		-	200,000	Blackstrap Reservoir	-	25,000
Other		13,300	14,000	Loverna Reservoir	-	250,000
		14,000	690,000			
Total						
<u>Cypress Hills Region</u>						
Eastend-Val Marie Irrig. Proj.	1937	10,000	13,000	Cypress Lake	100,000	100,000
				Eastend	2,000	2,000
				Val Marie Reservoirs	12,000	12,000
				Fifty Mile Reservoir	-	80,000
Consul-Vidora Irrig. Proj.	1945	7,000	10,000			
Ross Creek Irrig.	1949	2,000	3,000	Gros Ventre	4,500	8,000
Maple Creek Irrig.	1936	10,000	10,000	Downie Lake	10,000	10,000
				Junction	10,000	10,000
				Harris	5,000	5,000
				Duncairn	85,000	85,000
Swift Current Irrig. Proj.	1940	12,000	21,000	Highfield	13,000	13,000
				Gouverneur	10,000	10,000
Ponteix Project	1953	1,000	3,000	Cadillac	1,500	1,500
Cadillac Project	1953	700	800	Russell	2,000	2,000
Russell Creek Project	1951	900	1,200	Admiral	2,500	2,500
				Lafleche	30,000	30,000
Lafleche Project	-	-	8,000			
Other	-	67,300	98,000			
		110,900	168,000			
Total						
<u>Eastern Prairie Region</u>						
Lumsden-Fairy Hill Irrig.	1910	3,000	6,000	Buffalo Pound Lake	40,000	120,000
Souris-Estevan-Kisbey Irr. Proj.	1937	5,000	11,000	Dead Lake	3,000	50,000



Project	Year Started	Irrigable Acreage		Major Reservoirs	(Live Storage (Acre Feet))	
		Present	Ultimate Proposals		Present	Ultimate
Eastern Prairie Region (Cont'd)						
South Saskatchewan						
Extension – Qu'Appelle	—	—	24,000	Moose Mountain	9,000	9,000
Other		20,000	34,000			
Total		28,000	75,000			
Total Irrigation (Alberta & Saskatchewan)		1,069,500	2,705,800			











CAI DA 20

A56



# Annual Report

on prairie farm rehabilitation  
and related activities

1959  
1960



DA DEPARTMENT OF AGRICULTURE - PRAIRIE FARM REHABILITATION BRANCH - REGINA - SASK.







PRAIRIE FARM REHABILITATION

and RELATED ACTIVITIES

1959 - 60





# TABLE OF CONTENTS

	Page
INTRODUCTION.....	
ADMINISTRATION and ORGANIZATION.....	
WATER DEVELOPMENT PROGRAM .....	1
Farm and Community Projects .....	2
Large Water Development Projects.....	4
Mary Jane Storage Project .....	4
Neepawa Storage Project .....	4
Davidson Storage Project.....	4
Altawan Dam .....	6
Technical Assistance .....	6
COMMUNITY PASTURE PROGRAM .....	8
Pasture Operations .....	8
Pasture Services .....	9
Pasture Fees .....	9
Grazing Rates .....	10
Rates for Vaccine and Other Services.....	10
Breeding Services .....	11
Disease and Insect Control .....	11
Livestock Insurance .....	11
Haying.....	12
Regrassing .....	12
Fire and Fire Protection .....	12
Pasture Construction .....	13
Pasture Improvement .....	14
REHABILITATION and RESETTLEMENT.....	17
Consul Irrigation Project .....	17
Eastend Irrigation Project .....	18
Val Marie Irrigation Project .....	19
West Val Marie Irrigation Project .....	19
Maple Creek Irrigation Project.....	20
Swift Current Irrigation Projects .....	21
Bow River Resettlement Project .....	22
MAJOR IRRIGATION and RECLAMATION PROJECTS .....	23
St. Mary Irrigation Project .....	23
Investigations and Construction .....	24
Project Improvement and Maintenance .....	25
Project Operation .....	25
Agricultural Development .....	26
Bow River Irrigation Project .....	27
Project Construction and Improvement .....	27
Agricultural Development .....	29

# TABLE OF CONTENTS (continued)

	Page
South Saskatchewan River Project.....	29
Construction .....	31
Public Relations .....	35
Pre-Development Farm .....	35
Buffalo Pound Lake Water Supply Project .....	37
Emma Lake Conservation Project .....	37
Saskatchewan River Reclamation Project.....	38
Sipanok Area .....	38
Pasquia Area.....	39
Moose Lake Area.....	40
Assiniboine River Project .....	41
Assiniboine River Dykes.....	41
Russell and Shellmouth Projects.....	41
Holland Dam.....	42
Northwest Escarpment and Interlake Reclamation Projects .....	42
Northwest Escarpment .....	43
Interlake Region .....	44
Rivers Water Storage Project .....	46
British Columbia Projects .....	47
Mission Flats .....	47
B.C. Fruitlands Irrigation District.....	47
Surrey-Langley Drainage Project .....	49
ENGINEERING SERVICES .....	50
Design Division .....	50
Air Photo Analysis and Engineering Geology Division .....	51
Hydrology Division .....	52
Individual Project Studies .....	52
Watershed Studies .....	52
Special Investigations .....	53
Soil Mechanics and Materials Division .....	54
Drainage Division .....	56
CONSTRUCTION, EQUIPMENT and SUPPLY DIVISION .....	59
PLANNING and INFORMATION DIVISION .....	61
Library .....	62
Photo Section .....	62
APPENDICES .....	64
Appendix I	
Water Development Program — Progress by years in the Con- struction of Individual, Neighbor and Community Projects .....	64
Appendix II	
Water Development Program — Number of Individual, Neighbor, Community and Large Water Development Projects and amount of financial assistance paid from April 1, 1959 to March 31, 1960 .....	65



# TABLE OF CONTENTS (continued)

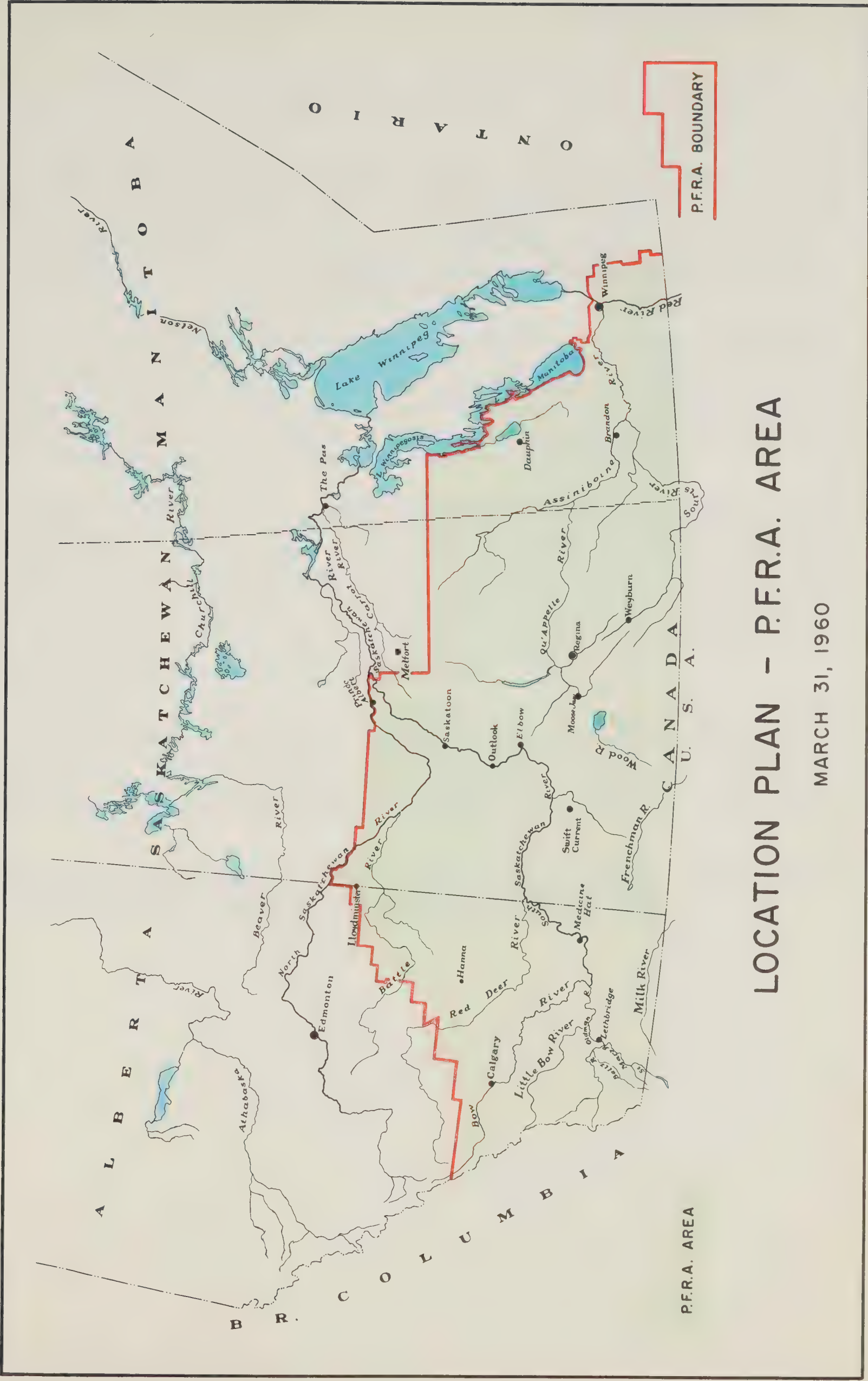
	Page
APPENDICES (continued)	
Appendix III	
Water Development Program – Number of Individual, Neighbor, Community and Large Water Development Projects and amount of financial assistance paid from April 1, 1935 to March 31, 1960 .....	66
Appendix IV	
Community Water Storage and Irrigation Projects to March 31, 1960 .....	67
Appendix V	
Cumulative Statement – Development and Operation of Community Pastures under the P.F.R.A. – 1938 to March 31, 1960 .....	83
Appendix VI	
P.F.R.A. Community Pastures in Operation During the Fiscal Year ended March 31, 1960 .....	84
Appendix VII	
Major Projects – Irrigation, Reclamation and Water Storage administered by P.F.R.A. to March 31, 1960 .....	87
Appendix VIII	
Prairie Farm Rehabilitation Act – Expenditures by Activities April 1, 1935 to March 31, 1960 .....	89
Appendix IX	
Expenditures by Provinces – P.F.R.A. and Special Votes under its Administration – April 1, 1935 to March 31, 1960 .....	91
Appendix X	
Total Irrigation Development – Alberta and Saskatchewan .....	92

# PLANS

## Plate Number

Location Plan of P.F.R.A. area .....	I
Small Water Projects per township .....	II
Community Pastures .....	III
Bow River Project – Hays Resettlement Area .....	IV
St. Mary Irrigation Project .....	V
General Plan – Bow River Irrigation Project .....	VI
General Plan – South Saskatchewan River Dam .....	VII
Pasquia Area Development – Sask. River Reclamation Project .....	VIII
Plan of Reservoir – Rivers Water Storage Project .....	IX





LOCATION PLAN - P.F.R.A. AREA

MARCH 31, 1960





## INTRODUCTION

The Act of Parliament which in 1935 gave birth to P.F.R.A. in the midst of Canada's most devastating drouth, provided specifically for "the rehabilitation of the drouth and soil drifting areas in the Provinces of Manitoba, Saskatchewan and Alberta". The immediate task of the Prairie Farm Rehabilitation Act was to promote the conservation of surface water resources on farms, and to encourage the use of cultural practices designed to combat the serious soil drifting problem resulting from the prolonged drouth of the 1930's.

With the recognition of the value and the need of government assistance in soil and water conservation, the Act was amended in 1937 to permit a land utilization and resettlement program to be initiated. In 1939 the Government of Canada decided that in order to provide for a long term water conservation and land utilization program, the Prairie Farm Rehabilitation Act would have to be established on a more permanent basis. Accordingly the Act, which originally was intended as a temporary emergency measure, was amended to remain in force indefinitely.

The P.F.R.A. area extends from thirty miles east of Winnipeg, Manitoba to forty miles west of Calgary, Alberta, a distance of some 850 miles; and from the U.S.A. boundary about 300 miles north to Prince Albert on the North Saskatchewan River which forms a section of the boundary line. The total area contains over 110 million acres of land. Some 50 million acres, or more than one-half the improved agricultural land in Canada is located within the P.F.R.A. area. The organization developed under P.F.R.A. to administer the rehabilitation program throughout this area, has in recent years also been made responsible for the supervision of conservation on all major irrigation and reclamation projects in Western Canada.

Through its 25 years of operation, P.F.R.A. has developed a long range program especially designed to help bring about necessary adjustments in prairie farming practices. By encouraging and assisting in water conservation and better land utilization, this program has already helped to stabilize farm income over a large area. Also, as a direct result of this program, diversification of agricultural production in several areas has helped to bring financial security to many farmers.

The following report deals primarily with P.F.R.A. activities during 1959, but it does also, in a general way, review P.F.R.A. progress in its various undertakings since 1935.





## ADMINISTRATION and ORGANIZATION

The Prairie Farm Rehabilitation Act is administered by a Director who is responsible to the Deputy Minister of Agriculture in Ottawa. The Director's office is located at Regina, Saskatchewan, where headquarters for the administration has been established. In addition to the Director's Office the organization at Regina consists of the Engineering Services Branch, and the Agricultural Services Branch which is responsible for the activities of the Water Development Branch and the Community Pasture Branch.

The Director's Office co-ordinates the activities of the different Branches and administers the Resettlement and Rehabilitation program. The Construction, Equipment and Supply Division; Land Division, Planning and Information Division; and Administration Division are directly responsible to the Director.

The Water Development Branch supervises the development of an extensive program of farm and community water storage projects, and numerous small scale irrigation schemes.

The Community Pasture Branch undertakes the construction of new pastures and supervises the operation and maintenance of the existing Community Pastures throughout Saskatchewan and Manitoba.

The Engineering Services Branch, composed of the following Divisions – Hydrology, Soil Mechanics, Design, Air Photo Analysis and Engineering Geology, Surveys and Drainage – performs all engineering services for the investigation, design, and construction of all projects under P.F.R.A. administration.

In addition to the Head Office in Regina, there are District, Regional, and Project Offices situated throughout the Western Provinces. From the Project Offices there is usually a further breakdown to Field Offices, the number depending upon the size and type of the project being administered by the Project Office.

Since P.F.R.A. activities are closely allied to those of certain Provincial Departments, every endeavour is made to co-operate with these agencies. Similarly the P.F.R.A. maintains a close liaison with other branches and departments of the Government of Canada, such as the Economics Division and Research Branch of this department and the Water Resources Branch of the Department of Northern Affairs and National Resources.

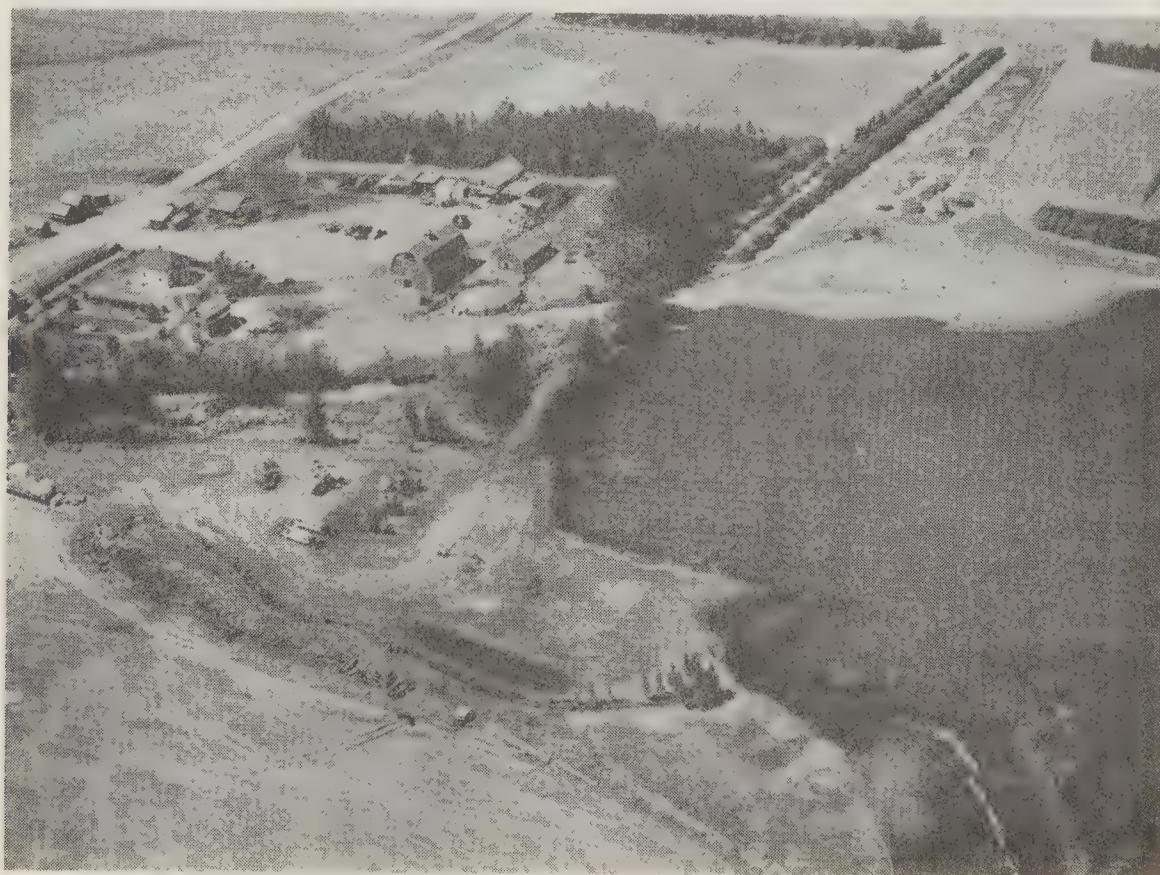




## WATER DEVELOPMENT PROGRAM

The water conservation program developed under the Prairie Farm Rehabilitation Act continued to grow during 1959-60 with water storage facilities throughout the P.F.R.A. area increasing both in number and capacity. The twenty-five per cent increase in the number of water development projects constructed during the year can be attributed to a number of factors. The drought conditions of 1957 and 1958 continued in many districts of the P.F.R.A. area in 1959. During the winter of 1958-59 light snowfall in the southern districts of all three Prairie Provinces resulted in practically no runoff in many drainage systems. With only limited rainfall during the following spring and summer seasons, many farm reservoirs became dry throughout the latter part of the year.

Another factor contributing to the increase in water storage projects was the increase in the rate of financial assistance paid on individual and neighbor projects which came into effect on April 1, 1959. This increase in rate, which approximately doubled the previous rate of assistance, has also resulted in a general increase in the size of farm water storage projects. Payments by P.F.R.A. on farm projects now represent about one-half of the total cost of construction. In addition to the above factors, the extension of



Typical stockwatering dam located in southwestern Saskatchewan ideally situated in relation to farm buildings for domestic water supply and irrigation.

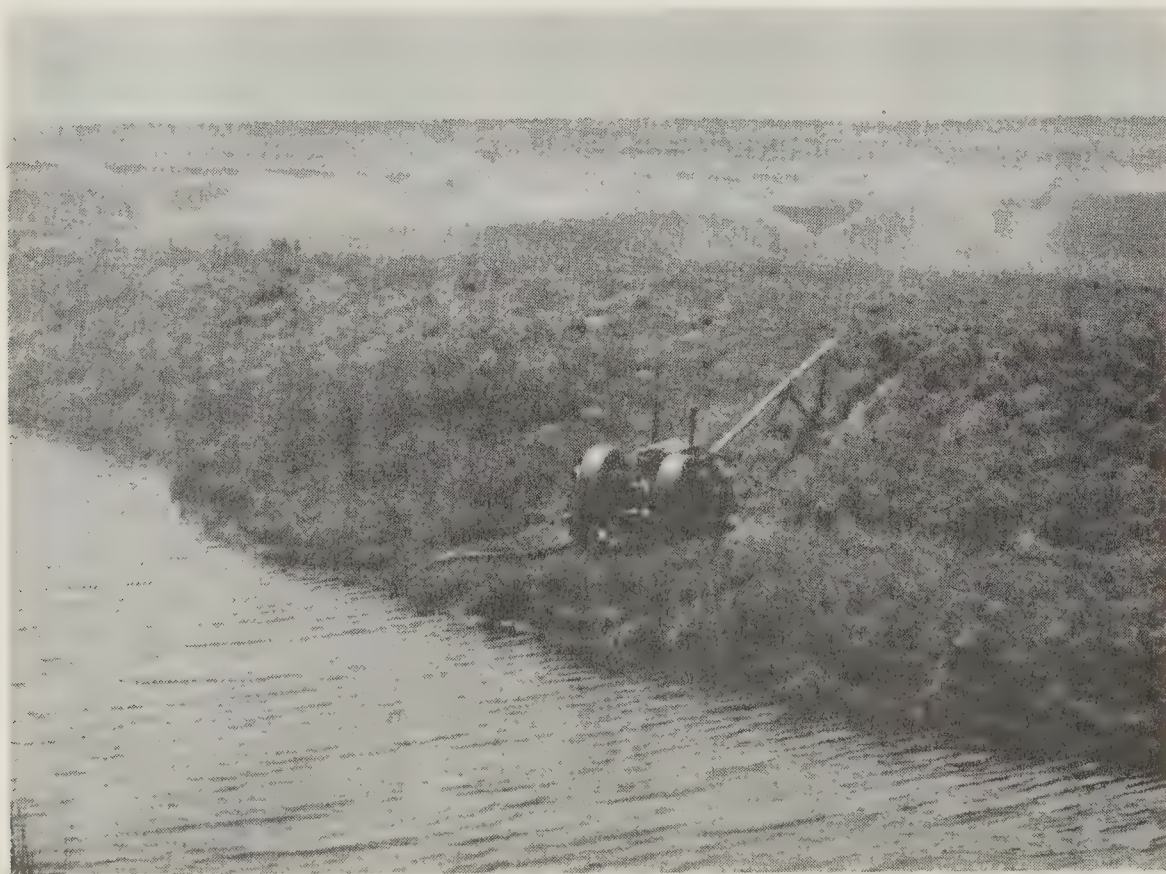


rural electrification has greatly increased the water requirements on the farm and in rural communities. The provision of engineering and financial assistance by P.F.R.A. in the development of water storage facilities for surface runoff is becoming an important factor in modernizing farm homes and farming operations. The prevailing drouth conditions, the increased financial assistance by P.F.R.A., the increase in water requirements on the farm, and the availability of construction equipment, resulted in a very large program of field services and construction in 1959.

The water conservation program administered by P.F.R.A. can be divided into three categories according to the size of the project, the number of people benefitting, and the cost of construction. These include farm and community, and large water development projects.

### Farm and Community Projects

Projects involving the construction of a small dam or dugout to serve a farm or neighboring farms, are classified as 'farm projects'. During 1959-60 construction was completed on 4,369 farm projects consisting of 3,974 dugouts, 259 stockwatering dams, and 136 irrigation schemes. Financial assistance amounting to \$990,355.92 was paid out by P.F.R.A.



With the dependable flow of water maintained in prairie streams, the irrigation of adjacent hay lands is made possible.

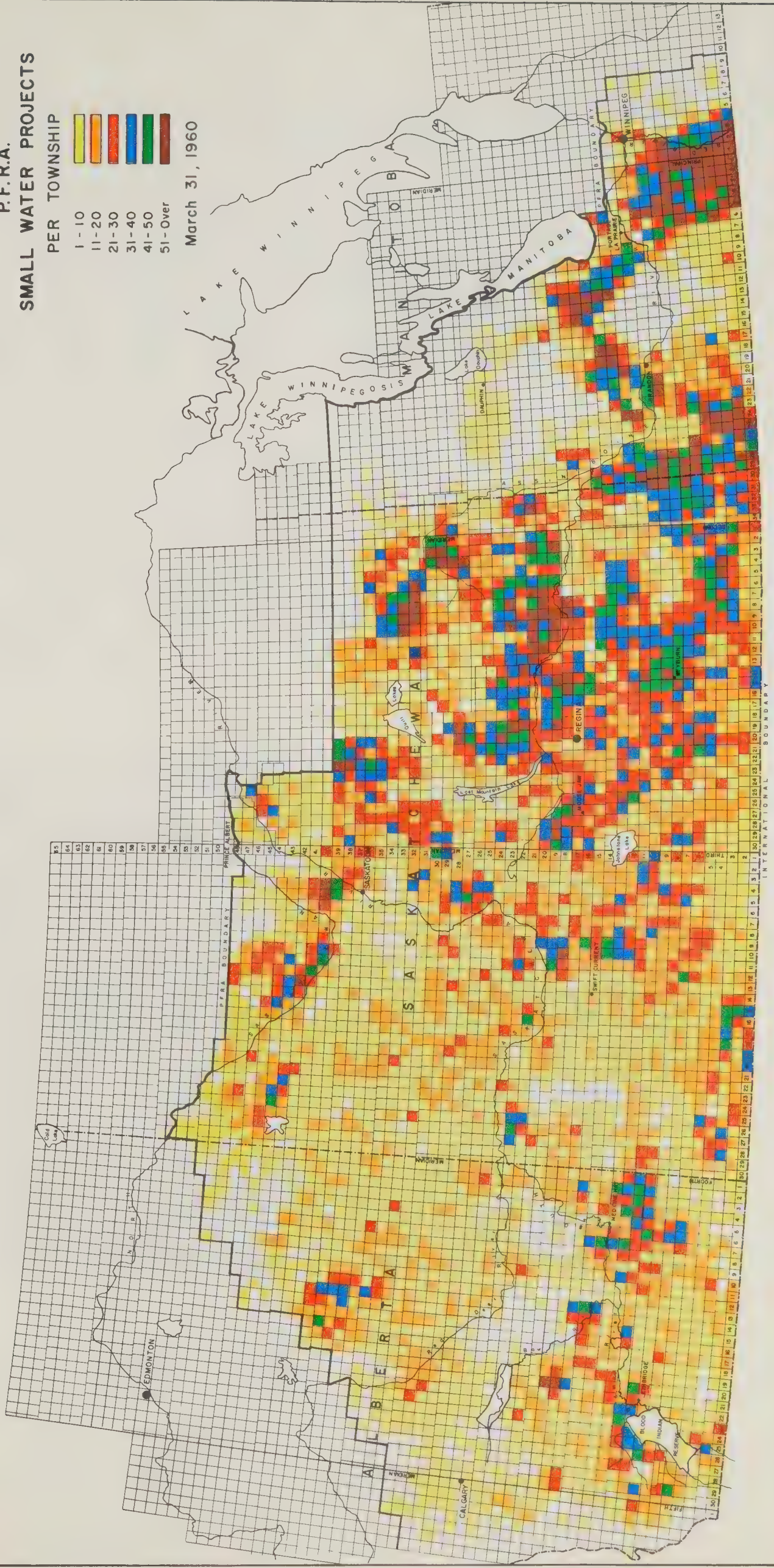


# P.F.R.A. SMALL WATER PROJECTS

PER TOWNSHIP



March 31, 1960







on these projects. This brings the total of farm projects constructed under the P.F.R.A. program since the inception of the program in 1935, to 64,554 projects.

The rate of assistance for earthwork on farm projects in 1959 was 7¢ per cubic yard with maximum grants for individual farm dugouts, stock-watering dams or irrigation schemes amounting to \$250.00, \$300.00 and \$600.00 respectively. Where two or more farmers found it to their advantage to pool their water resources, the maximum financial assistance paid was \$1,000.00.

Concerning the development of community water conservation projects, in addition to supplying all engineering services, P.F.R.A. also assumes a larger share of the construction costs. During the fiscal year, construction was completed on 44 new 'community projects' advanced to the construction stage in 1959, as well as on 22 projects carried over from 1958. Since 1935 P.F.R.A. has supervised the construction of 748 community water development projects. A complete list of the community projects constructed since the program started in 1935, may be found in Appendix IV, showing the type, location, size and cost.



A newly constructed community-sized dugout situated near a town in southern Saskatchewan.

## Large Water Development Projects

The construction of large water conservation projects is undertaken by agreement between the Federal Government and the provincial or local government concerned in areas where there is a special need. Over one hundred of these projects have been constructed since the program came into effect in 1935. In 1959, four of these larger projects were under construction, three of which were completed during the year. A brief description of each of these is included in this report.

### Mary Jane Storage Project

The Mary Jane water conservation project is located six miles northwest of the town of Manitou in southwestern Manitoba on the Mary Jane Creek, a tributary of the Pembina River. The earth fill dam will create a water storage reservoir which will provide water for downstream agricultural purposes and also supply water for domestic use in the surrounding rural communities. The reservoir, which has a storage capacity of 1,150 acre feet, involved the construction of a dam 46 feet high and 520 feet long. The drop inlet spillway will pass 1,440 c.f.s. while the emergency spillway will carry an additional 1,260 c.f.s. At full supply level the Mary Jane Storage reservoir will be about 1 1/2 miles long with an average width of about 500 feet. Construction began in September 1958 and received final inspection and acceptance as a finished project on January 27, 1960.

### Neepawa Storage Project

A dam constructed on the Whitemud River east of the town of Neepawa, Manitoba, will create a reservoir with a capacity of 3,800 acre feet. By providing a means of balancing the flow in the Whitemud River, this project will assist in securing the livestock industry of the area. It will also provide a dependable supply of water for domestic use in rural and urban centres downstream. The earth fill dam is 1,600 feet long and 38 feet high. A concrete chute-type spillway will have a maximum discharge of 9,800 c.f.s. Work commenced on this project in May 1959 and was completed other than a small amount of trim work still to be done in the spring of 1960, by December 31, 1959.

### Davidson Storage Project

The Davidson water storage project is located on a tributary of Squaw Creek about one mile southeast of the town of Davidson in central Saskatchewan. This project will provide a means of conserving runoff water for stockwatering and domestic use in an area where domestic water supply has been a serious problem. The reservoir created by the 20 foot earth fill dam will have a storage capacity of 400 acre feet and will extend upstream about 1 mile. A drop inlet spillway with a discharge capacity of 400 c.f.s. will be used to





Constructing forms and pouring concrete for cutoff and foundation on the Neepawa water project, Manitoba.

Ref. No. 51976-10



Excavating core trench along centre line of the Altawan Water Storage project during the initial stages of construction.

Ref. No. 18080



pass excess flows. Greater flows will be carried by the emergency spillway which was established by converting a former chute-type spillway into a weir. This project, construction of which began in the spring of 1959, was also completed by year end.

### Altawan Dam

The Altawan Dam is located on Lodge Creek about seven miles southwest of Govenlock in the extreme southwestern part of Saskatchewan, eleven miles north of the U.S.A. border and five miles east of the Alberta boundary. This is one of the driest rangeland areas in Western Canada. The storage created by the Altawan Dam will provide water for stockwatering, irrigation, and stream-flow maintenance. The reservoir, which will hold some 5,830 acre feet of water, will be about 2 1/2 miles long and 1/4 of a mile wide. The dam itself will be 55 feet high and 1,200 feet long. The chute-type spillway will have a maximum discharge of 3,900 c.f.s. while the emergency spillway will pass 5,200 c.f.s. Construction on the earth fill was completed in 1959 and it is expected the spillway will be constructed during 1960.

### Technical Assistance

In addition to financial assistance provided for "farm" and "community" projects, the following free field services were supplied by the Water Development Branch in 1959-60.

	<u>Agricultural Services</u>	<u>Engineering Services</u>
<u>Dugouts</u>		
Preliminary Calls	2,336	
Final Inspections	4,783	
Miscellaneous Inspections	680	
<u>Stockwatering Dams</u>		
Preliminary Calls	258	
Final Inspections	68	339
Miscellaneous Inspections	213	994
Surveys Completed		443
Plans Prepared		288
<u>Irrigation</u>		
Preliminary Calls	305	
Final Inspections	62	132
Miscellaneous Inspections	199	757
Surveys Completed		227
Plans Prepared		260



Technical Assistance (Cont'd)

Agricultural Services

Engineering Services

Community Projects

Preliminary Calls	142	
Final Inspections	35	
Miscellaneous Inspections	131	
Projects Investigated		142
Projects Built		35
Surveys and Plans Prepared		42
Maintenance		50
	<hr/>	<hr/>
Sub Totals	9,212	3,709
TOTAL		<u>12,921</u>

## COMMUNITY PASTURE PROGRAM

By agreement with the Provinces of Saskatchewan and Manitoba, lands found by economic and soil surveys to be unsuitable to farming, are turned over to the Federal Government to be developed into Community Pastures. Under this arrangement the provinces concerned select the areas to be developed and obtain control of the land. This land is then leased to the Government of Canada, which agrees to construct, operate, maintain and improve community pasture facilities in the areas designated. Families located within the boundaries of proposed pasture areas are given assistance to move to better land in the same or neighboring municipalities where they may derive a better living from farming and be in a position to take advantage of the community pasture facilities. Where such lands have not been available, farmers have been moved to irrigation projects built specifically by P.F.R.A. for resettlement purposes.

Since the program was initiated in 1937, sixty-five pastures have been constructed by P.F.R.A. involving the development of some 1,886,364 acres of land. Included in this is the new 71,820 acre McCreary Pasture which was constructed in 1958-59 and will go into operation in the spring of 1960; the Cote-San Clara Pasture which just completed its first year of operation, and the Excel-Key West Pasture which was divided into two separate units during 1959. On these pastures P.F.R.A. handled 122,820 cattle, 1,408 horses and 2,920 sheep belonging to 6,331 farmers and ranchers during the current operating season, or an increase of 1,901 cattle and 496 patrons over 1958.

Detailed statistics on the community pasture program from 1937 to 1959 inclusive, may be found in Appendices V and VI of this report.

### Pasture Operations

In a number of pastures in Saskatchewan, the continuing drouth conditions of the past three years, followed by a winter of limited snowfall and practically no spring runoff, created a serious pasture allocation problem, particularly in those pastures which depend upon dams and dugouts for stock-watering. Several livestock owners in areas where it was necessary to reduce the number of cattle accepted for pasturing, trucked their cattle in some cases, long distances to P.F.R.A. community pastures in both Manitoba and Saskatchewan where additional stock could be accommodated. In Saskatchewan, dry conditions continued until late in June when heavy rains improved both water supply and grazing conditions. Excellent grazing was available in Manitoba pastures throughout the season, although a sudden severe snowstorm just before roundup time in Manitoba, caused many difficulties and made it necessary to feed hay to the cattle in the Westbourne, Lakeview and Langford Pastures.





Ranchers and farmers in the Robsart area of southwestern Saskatchewan driving cattle home following fall round-up in the Govenlock Community Pasture.

Ref. No. 14112

The livestock in all pastures made satisfactory gains in weight during the season and were in exceptionally good condition in the fall.

For the second consecutive year, grasshoppers presented a very serious problem in several pastures. Aerial and ground spraying for grasshopper control was carried out in nine pastures during 1959, involving a total expenditure of \$22,323.32.

#### Pasture Services

Pasturage is allocated by the local Advisory Committee for each pasture on the basis of need in accordance with the established policy. The Committee also sets the maximum number of stock per patron, keeping in mind the estimated carrying capacity for good range management.

#### Pasture Fees

There was no change in the pasture rates which came into effect on August 1, 1958. Following is the present rate schedule for pasture services:

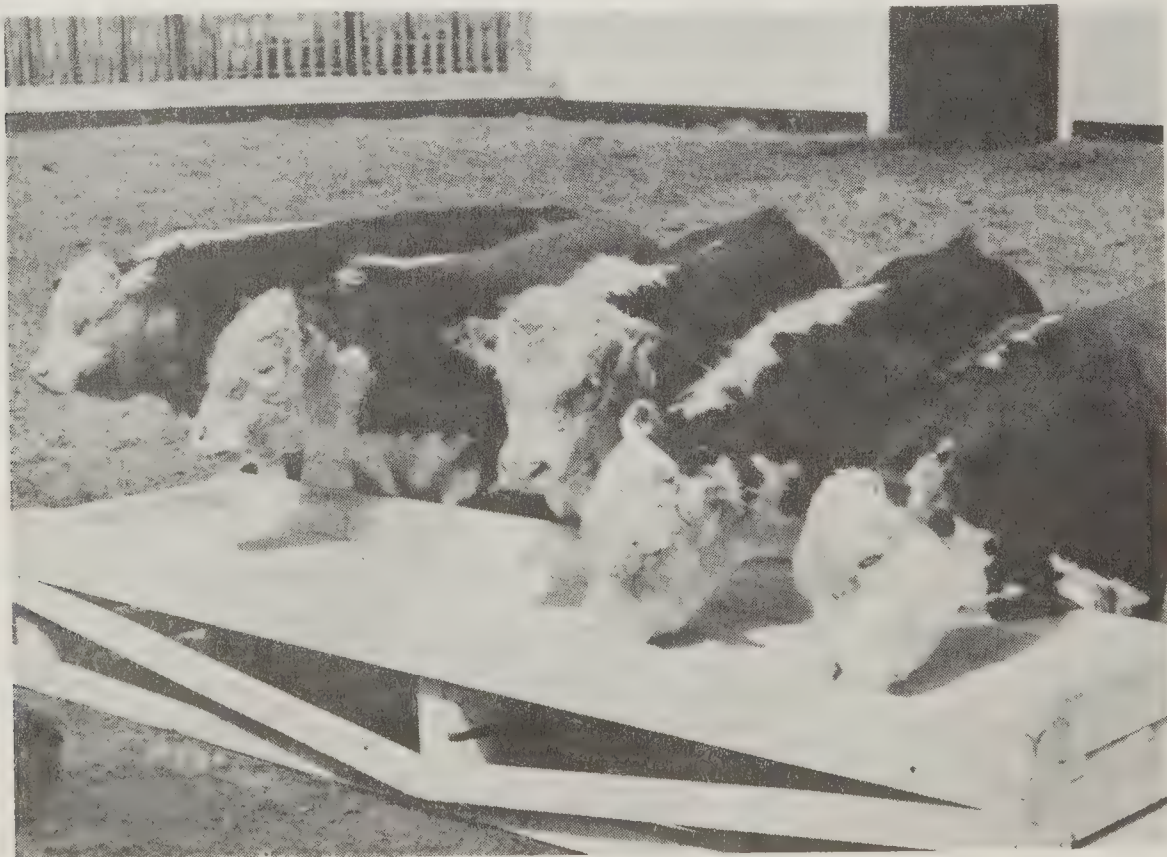
## Grazing Rates

Cattle per day per head	.03
Horses per day per head	.04
Sheep per month per head	.10 (provide own herder)
Cows (breeding service)	3.00 per head
Colts of current year, sucking with dam, born before August 1st.	4.00 per head
Calves of current year, sucking with dam, born before August 1st.	3.00 per head

No charge is levied on colts and calves born in pasture after July 31st of current year to end of summer season. A minimum grazing charge of \$4.00 per head for horses, \$3.00 per head for cattle, and 30 cents per head for sheep is levied against any of these animals recorded for pasturage.

## Rates for Vaccine and Other Services

Vaccines	.15 per single dose
Dehorning	.50 per head
Warble and Horn Fly Spraying	.15 per head
Mineral Supplement	.35 per head
Castration: Cattle under 6 mos.	1.00 per head
Cattle 6 mos. & over	2.00 per head
Encephalomyelitis & Special Vaccines	At cost



Young Hereford bulls being raised at the P.F.R.A. bull station, Wise Creek Community Pasture in southwestern Saskatchewan.

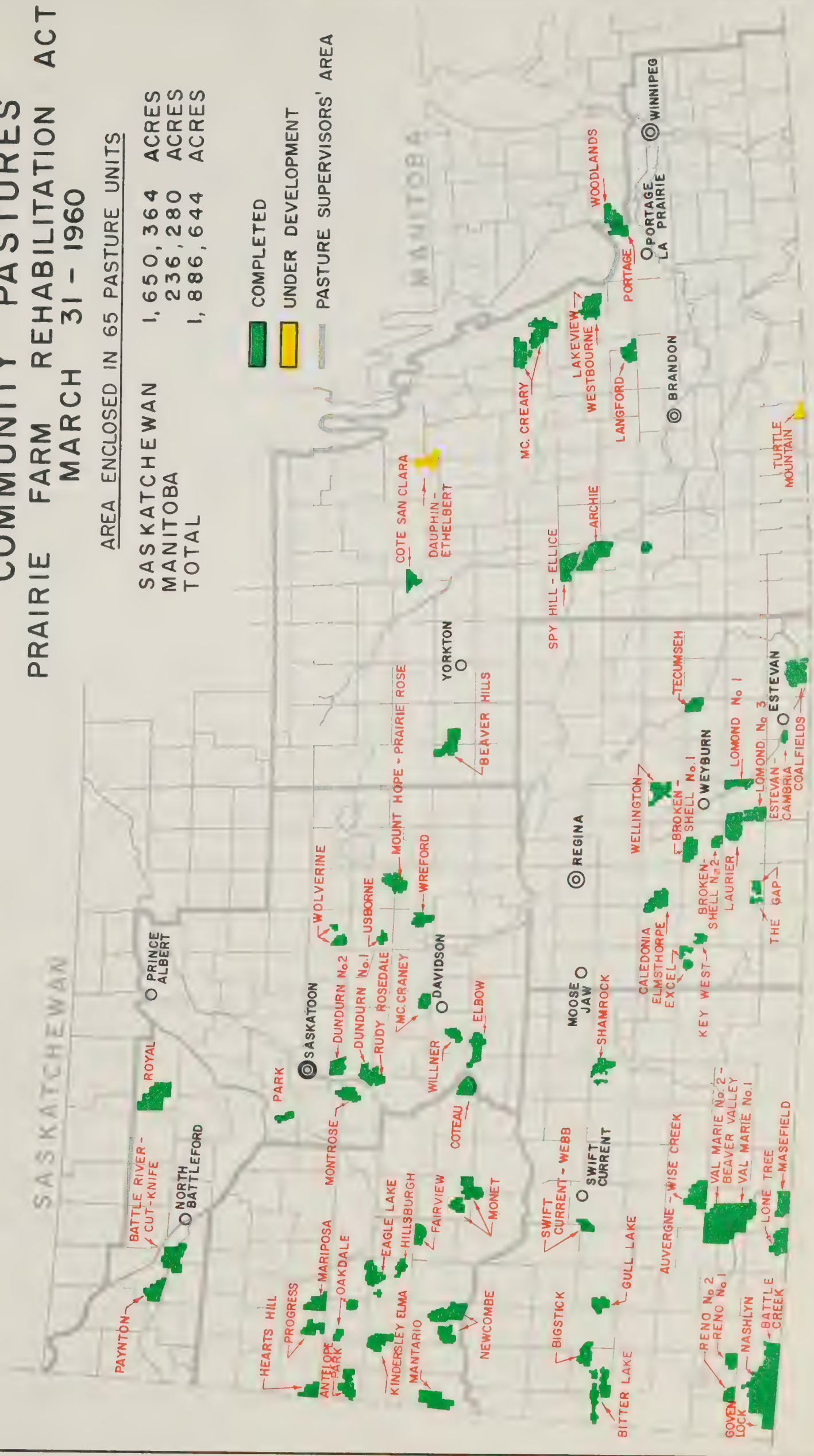


# COMMUNITY PASTURES PRAIRIE FARM REHABILITATION ACT MARCH 31 - 1960

AREA ENCLOSED IN 65 PASTURE UNITS

SASKATCHEWAN	1,650,364	ACRES
MANITOBA	236,280	ACRES
TOTAL	1,886,644	ACRES

COMPLETED  
 UNDER DEVELOPMENT  
 PASTURE SUPERVISORS' AREA







## Breeding Services

As a requested service by the pasture patrons, P.F.R.A. purchases, maintains, and rents a sufficient number of pure bred bulls to supply breeding services in all community pastures. The breed of bulls used, Hereford, Shorthorn or Aberdeen Angus, is determined by majority vote of the pasture patrons. An annual rental of \$40.00 is charged for each bull supplied to a pasture. In 1959 eleven hundred and fifty bulls were used in the breeding service program. Eight hundred and forty-eight of these bulls were owned by P.F.R.A. and 302 were rented from pasture patrons. As in former years, 90% calf crop resulted from the 35,984 cows serviced in 1959.

To provide an assured supply of uniform, high quality breeding stock, P.F.R.A. purchases a number of yearling bulls each year. These bulls are developed at bull stations associated with the Archie and Bitter Lake Community Pastures. In 1959, one hundred and ninety-six yearling bulls were purchased to meet anticipated replacement requirements.

## Disease and Insect Control

During the 1959 season no serious outbreaks of disease occurred in P.F.R.A. community pastures. There was very little Pink Eye or Foot Rot as compared to some years. The death of eight cattle within a few days in the Dundurn Pasture was diagnosed as Blackleg. As a preventative measure against further losses, all cattle in that particular area were vaccinated a second time. No further losses were experienced from this cause. All cattle affected with warbles were treated upon entering the pasture. An effective program for the control of external parasites such as horn flies, mosquitoes, lice and ticks was carried out by the use of pressure sprayers and treated back scratchers.

The patrons of a number of pastures have for several years engaged a veterinarian to vaccinate all heifer calves against Brucellosis at fall round-up time. More pastures appear to be engaging in this practice each year. All cattle handled on community pastures are subject to local municipal bylaws and Health of Animals Division regulations in respect to Brucellosis and Tuberculosis eradication programs.

## Livestock Insurance

To offset inevitable death losses, mutual insurance is carried by 35 of the pastures. The total losses in all pastures from various causes including missing livestock, amounted to 665 head of cattle and 2 horses. These losses represent approximately one-half of one per cent of the total livestock handled. Of this number, 351 head were eligible for insurance. A surplus of \$1,487.37 was added to the previously accumulated insurance reserve bringing the total on January 1, 1960 to \$58,636.15.



## Haying

Each year a large amount of hay is harvested in community pastures. This hay is used to feed the pasture bulls and headquarters stock. During 1959 a total of 4,070 tons of hay and greenfeed was harvested by the pasture managers and in a few cases by adjacent farmers who put up a small percentage of this hay on a share basis.

## Regrassing

Under the regrassing program carried on in community pastures, 2,781 acres were seeded to grass in 16 operating units in 1959. This was made up of 1,954 acres of crested wheat grass, 542 acres of brome and crested wheat grass, and 288 acres of mixed grasses. No grass seed was harvested on community pastures during the year.

## Fires and Fire Protection

No buildings were destroyed by fire in 1959-60. All pasture buildings are equipped with approved fire extinguishers. Regular inspections assure that proper fire prevention measures are observed and that preventative equipment is maintained ready for immediate use.



Herbicidal spraying of regrowth along fireguards in the Beaver Hills Community Pasture.



Several small grass fires occurred in the pastures during the year. These were caused mainly by lightning. To assist in the control of fires all pastures are protected by a network of fireguards which are maintained by two motorized graders. Some 757 miles of fireguards were bladed by these units in 1959. Many additional miles were maintained either by contract or by pasture managers using pasture equipment.

### Pasture Construction

To maintain and extend pasture facilities, eight construction crews and three water development crews were employed by P.F.R.A. in 1959-60. In addition to the work in the operating pastures, initial construction on the 71,820 acre McCreary Pasture was completed and a start was made on the fencing of the Turtle Mountain Pasture in southern Manitoba. The water development crews handled 70 maintenance jobs, erected 32 windmills, and set 125 new watering troughs. With the use of privately owned equipment, 3 dams, 26 dugouts and 15 springs were constructed and developed. A total of 38 new wells were dug and equipped with pumping equipment.

Following is a summary of pasture construction activities for the 1959-60 season:

Particulars	Projects completed in 1959	Repair work completed in 1959	Total to March 31, 1960
Fencing (miles)	175 1/4	141 1/2	4,506 1/4
Corrals, No. of	2	8-1 Dsmltd.	162
Pasture Managers' Dwellings	2	3	58
Riders' Cabins	1		37
Barns	2		59
Garages	2		59
Bull Sheds	5	4	54
Others (Granaries, Oil Sheds, Chicken Houses, Pump Houses)	6	6	170
<u>Water Development</u>			
Windmills, No. of	32	16	403
Wells, No. of	38	54	350
Springs, No. of	16		183
Dams, No. of	21	1	271
Dugouts, No. of	41	10	647
Total number of acres enclosed as at March 31, 1959			1,811,984
Total number of acres enclosed in 1959 construction season			74,380
Total number of acres enclosed as at March 31, 1960			1,886,364



## Pasture Improvement

A special pasture improvement section of the community pasture branch supervises and directs the pasture improvement operations in both the prairie and parkland pastures. This section plans and carries out an investigational and work program designed to increase the usefulness of the pasture areas. To determine the effectiveness of the various new and improved operations, the pasture improvement section works in co-operation with the Federal Research Stations which advise on new methods and procedures and carry out a program of production measurements.

In the open plains area regrassing, stockwatering development, and the extension of pasture irrigation projects were the main types of work undertaken by the Pasture Improvement section during 1959. Eleven thousand and thirty acres were regrassed, 14 dugouts and 9 dams were constructed and irrigation development work was carried out on 8 pasture irrigation projects in southwestern Saskatchewan. These included the flood irrigation scheme in the Govenlock Pasture; the Pump-Gravity, Sprinkler and Flood schemes in the Bitter Lake Pasture; Lonesome Lake and Lewis Flats Flood schemes in Reno No. 1 Pasture; Dixon and Dido Sloughs in the Battle Creek Pasture; the Dry Lake project in Beaver Valley Pasture; and the irrigated pasture area associated with the West Val Marie Irrigation Project in the Val Marie Pasture. In



Ridging flood irrigation land, Govenlock Community Pasture in experiment to determine the value of such techniques for improved production on poorly drained soils.



addition, surveys were completed on a proposed flood irrigation area extension to the Battle Creek Pasture, on the river flats of the Lodge and Middle Creeks in the Govenlock Pasture, on a proposed flood irrigation area in the Auvergne-Wise Creek Pasture and on a possible flood irrigation area on the Frenchman River Flats in the Val Marie Pasture.

Moisture conditions during the year were variable in the open plains. Spring drought conditions gave way to heavy rainfall in the early summer with dry weather again being experienced during the early fall. Considering the limited rainfall received and the small amount of spring flooding, yields on the various irrigation projects which have been developed in the open plains pastures were high, particularly on those areas being developed for tame grass production.

In previous years various soil mechanical treatments have been undertaken including tooth pitting, disc pitting, contour furrowing, and sub-soiling. Measurements to determine the effectiveness of these treatments were continued by the Pasture Division of the Swift Current Experimental Farm.

In the parkland area, community pasture work carried on by the Pasture Improvement section, was mainly concentrated on bush spraying operations for regrowth along fence lines and in previously cleared areas. Spray application was by turbine sprayers in the Beaver Hills and Royal Pastures, by high pressure sprayers in the Woodlands and Portage Pastures, and by aircraft in the Cote-San Clara and McCreary Pastures. Ground spraying was carried out on about 4,500 acres with aerial spraying covering around 2,000 acres. Further spraying by air was curtailed by adverse weather conditions.

Land clearing by mechanical methods was limited to rotary cutting as a fence line maintenance operation, except in the Langford Pasture where clearing by rotary cutters was continued in the valley area where a high water table exists. Mechanical methods for clearing new areas have been discontinued except in fireguarding in the Lakeview Pasture. Large acreages are gradually being cleared in the Royal, Portage, Payton, Battle River-Cut Knife, and Park Pastures by means of the controlled burning of knocked down and standing growth. This is made possible by a system of fireguards which were completed in 1958. Controlled burning as a land clearing operation was particularly successful in the Beaver Hills Pasture during the 1959 season.

The mechanical clearing operations completed in 1957 and the follow-up operations of burning and herbicidal spraying, have made large areas available for regrassing at a small cost per acre as compared to the conventional methods of land clearing. Regrassing operations in parkland pastures showing a trend to high grazing demand, are being planned on a long-term basis.

In 1959 regrassing operations carried out by the Pasture Improvement section in the parkland pastures were confined to the seeding of grass on about 110 acres associated with drainage projects on the Beaver Hills Pasture. With

the exception of a 300 acre area being developed for forage crop production, this completed the regrassing program for the Beaver Hills Community Pasture.

As a result of the pasture improvement program, the productiveness of P.F.R.A. community pastures, particularly in the parkland area, has been materially increased, and pasture conditions in general are continually being improved.



## REHABILITATION and RESETTLEMENT

Under the terms of the Prairie Farm Rehabilitation Act, provision is made for the rehabilitation and resettlement of farmers from areas of the prairies where drouth conditions have rendered farming a hazardous and frequently uneconomic pursuit.

Where it has been possible to achieve satisfactory rehabilitation without the necessity of moving farmers from their present locations, this has been done through the P.F.R.A. water development and community pasture programs. In other instances it has been necessary to move settlers to other areas where they can be assured of an adequate living from farming.

In this connection irrigation has played a major role both in stabilizing production on farms in the drouth area, and in providing improved land on which farmers can become permanently rehabilitated. In particular, the Val Marie, West Val Marie, Consul, Eastend, Maple Creek and Swift Current projects in the low rainfall area of southwestern Saskatchewan, are typical of projects which P.F.R.A. has built and continues to operate specifically for rehabilitation and resettlement purposes. By the construction of a series of storage reservoirs on rivers and streams originating in the Cypress Hills, water supplies from melting snow are made available for irrigation. The irrigated lands associated with these projects are divided into 40-60 acre plots and made available to farmers in surrounding areas for the production of livestock feed. In 1959 some 560 farmers produced over 40,000 tons of forage and almost 46,000 bushels of feed grain on the above community irrigation projects supervised by P.F.R.A. In addition to this, P.F.R.A. has provided engineering advice and financial assistance to thousands of smaller individual, neighbor and community irrigation schemes throughout the drouth area for the purpose of stabilizing feed supply.

Where it has not been possible to effect the rehabilitation of farmers on the land they are operating, special arrangements have been made whereby farmers may receive assistance to move to irrigated lands in southern Alberta which have been developed by the Federal Government for resettlement purposes.

Following is an account of the progress and development on the irrigation projects in Saskatchewan which were built especially for rehabilitation and resettlement purposes and which the P.F.R.A. on behalf of Canada continues to operate.

### Consul Irrigation Project

The Consul area of Saskatchewan is a semi-arid region slightly drier than other tracts of range land in southwestern Saskatchewan. The area is ideal for cattle raising when a reliable source of winter feed is available. This creates

a constant demand for irrigation land. Water is supplied to land in the Consul district from the Cypress Storage Reservoir by means of weir-type diversions in Battle Creek which supply the McKinnon, Richardson and Nashlyn Canals.

The Consul project has a potential irrigable area of approximately 3,570 acres. In 1959, two thousand nine hundred and forty acres of land were operated by 50 plowholders, 440 acres were under development and the remaining 190 acres, which are fringes of good quality land, are to be developed by the plowholders. During the growing season 5.3 inches of precipitation were recorded in the Consul area. This was supplemented by the use of 4,000 acre feet of water to irrigate 2,340 acres of land with two applications of water, and 450 acres with one application. The 4,280 tons of feed produced on the project in 1959 was sufficient to supplement the winter feed requirements of about 4,000 head of cattle and 2,000 sheep owned by the farmers on the project. Since 1952 there has been an increase of about 2,800 in the number of cattle owned by farmers making use of the irrigated land on the Consul project.

Drainage work continued during the year and several surface drains were cleaned and improved during the construction season. The tile drain installed at Consul in 1955 has lowered water tables in the seepage area, and the land which was sown to oats in 1959 will be ready for forage crop production in 1960. In addition to the maintenance and improvement work, a P.F.R.A. crew located on the project, also handled the distribution of water to individual irrigators.

### Eastend Irrigation Project

Located on the Frenchman River which flows southeast out of the Cypress Hills, the Eastend Irrigation Project extends for fifteen miles southeast of the town of Eastend, Saskatchewan. Irrigation water for this area is supplied from the Eastend Reservoir and in dry periods this storage is supplemented from the Cypress Storage Reservoir in the Cypress Hills at the headwaters of the Frenchman River. The project has a potential irrigable area of approximately 3,300 acres. In 1959, fifty plowholders operated 2,740 acres; 2,600 of which were in forage crops, 100 acres in coarse grain crops, and 40 acres in summerfallow. During the growing season only 4.8 inches of precipitation were recorded in the project area. To supplement this, one application of water was used on 980 acres, while 1,710 acres received two applications. During the 1959 season the total water consumption on the project was 4,500 acre feet. Feed production amounted to 3,100 tons which was sufficient to meet the feed requirements of 3,600 head of cattle and 2,000 sheep owned by the plowholders. There are now, 1,520 more acres in forage and 2,100 more cattle on the project than there were in 1953. This increase in livestock and forage production combined with dry land farming, has created more efficient farm units.



During the 1959 season P.F.R.A. completed the development of a new area known as the Uglum Extension, which consists of 450 acres of irrigable land. Three hundred acres of this new area were seeded to forage crops and irrigated by P.F.R.A. This land will be made available to local livestock producers in 1960.

A small P.F.R.A. crew was employed for repairing irrigation structures, distributing water to individual farmers, and doing general maintenance work on the project.

Land levelling, improved surface drainage and careful application of water have prevented the problem areas from deteriorating and resulted in improved conditions throughout the project.

### Val Marie Irrigation Project

The Val Marie Project is located in the Frenchman River Valley downstream from Eastend and extends for several miles northwest and five miles southeast of the village of Val Marie. Water for irrigation is obtained from the Cypress Hills via the Frenchman River with local storage in the Val Marie Reservoir upstream from the project area.

Of the 4,680 acres of irrigable land on the Val Marie Project, 75 farmers cropped 4,180 acres in 1959, producing 5,150 tons of forage and 3,000 bushels of oats for feed. As a result of severe winter damage to alfalfa crops, the average yield dropped from about 2 tons per acre to 1.4 tons as 65% of the project produced only one cutting of hay. This was sufficient feed to carry the basic herds of the plot operators. Since 1950 the cattle production on this project has doubled to 5,800 in 1959. During 1959 farmers on the project irrigated 580 acres once, 2,485 acres twice, and 1,030 three times. Five hundred and eighty-five acres were under development and received no irrigation. The precipitation during the 1959 growing season amounted to 5.5 inches.

Maintenance work in 1959 included the installation of new check and turnout structures on both the main and lateral canals, the construction of two bridges and the cleaning of all ditches in the south block. As part of the project improvement program, 130 acres were scraper levelled and 175 acres were prepared for levelling in 1960. During the year the project maintenance crew also supervised the distribution of irrigation water to individual farmers.

### West Val Marie Irrigation Project

Located in the Frenchman River Valley fifteen miles northwest of the village of Val Marie, the West Val Marie project, which is upstream from the Val Marie reservoir, contains 3,500 acres of potentially irrigable land. As on the Val Marie and Eastend projects, irrigation water is obtained from the Cypress Storage Reservoir via the Frenchman River. Local storage is provided by the West Val

Marie Reservoir from where water is distributed to the project both by gravity and by pumping systems. In 1959, the 52 farmers served by the project, operated 2,730 acres of irrigable land, producing 3,730 tons of feed. The decrease in production from 2.2 tons per acre in 1958 to 1.5 tons in 1959, was caused mainly by the shorter irrigation season as it was necessary to drain the reservoir in July to construct a new concrete spillway. Farmers were able to irrigate 1,680 acres of land twice, while 750 acres received only one irrigation. Precipitation during the growing season was 5.5 inches.

The West Val Marie project produced enough supplemental feed to carry the 3,500 cattle owned by the ploholders. In addition to the feed produced, 1,100 cattle winter-graze the project. These cattle are fed along the sheltered fringe of the river if weather conditions become severe. Besides the irrigated forage crop area, 800 acres of irrigated crested wheat grass are fenced out for pasture purposes as part of the Val Marie Community Pasture.

A considerable amount of development and maintenance was carried out on the project in 1959. The West Val Marie dam was improved and a new concrete spillway was constructed. The capacity of the reservoir will be increased from 2,200 to 4,100 acre feet of water. Additional maintenance work was done on the canals and roads by a P.F.R.A. project crew using project machines and equipment.

### Maple Creek Irrigation Project

In the rough hilly topography of the Maple Creek district of southwestern Saskatchewan, conditions are more favorable for raising livestock than producing cereal crops. The strong Chinook winds peculiar to that area cause high evaporation on the generally light textured soils, and this, combined with low annual precipitation, makes irrigation a vital factor in maintaining the agricultural economy of the region.

The Maple Creek project has two main irrigation districts operated by P.F.R.A., and several districts where farmers operate their own land under a spring flood license. The Maple Creek Flats, west of the town, contain 3,500 acres of irrigable land, while the "V" Flats, twenty miles north of Maple Creek, contain about 1,900 acres. There are some 3,750 acres of private flood land operated by the farmers themselves with water being obtained through P.F.R.A. storage reservoirs.

The late cool spring of 1959 in the Maple Creek area, produced a low spring runoff. There was sufficient water in the storage reservoirs, however, for farmers and ranchers to irrigate 1,800 acres of land once, and 3,700 acres twice, as well as for the flood irrigation on private lands. During the year 138 farmers and ranchers produced 14,800 tons of forage and 21,000 bushels of coarse grain on the project areas. Production averaged 2 tons per acre on all the hay land but averaged over 3 tons per acre on irrigated land that had been improved by scraper levelling.





Farmer windrowing Alfalfa in preparation for baling on field of irrigated land, Maple Creek Irrigation Project.

Ref. No. 20016

Development work on the Maple Creek project has included the scraper levelling of 1,000 acres of irrigable land in the last four years. This levelling has greatly improved the efficiency of irrigation, provided better drainage, and produced increased yields of forage crops. As a result of this increasing production on the Maple Creek project, the number of livestock in the area has doubled since 1953, and there has been no feed shortage since 1949. Repair and maintenance work on the project in 1959 was carried out by a P.F.R.A. crew using project supplies and equipment.

#### Swift Current Irrigation Projects

In the Swift Current, Waldeck, Rush Lake and Herbert districts north-east of the Cypress Hills region, approximately 20,000 acres of potentially irrigable land, of which 14,500 acres are presently undergoing development, are supplied with irrigation water from the Duncairn Reservoir southwest of Swift Current and the Highfield reservoir near Rush Lake. The Rush Lake district is the only district operated by P.F.R.A. Other districts are supplied with water by P.F.R.A. but are operated by private individuals, the Research Station, or the Provincial Conservation and Development Branch.



The North Rush Lake area, which has approximately 4,700 acres of developed irrigable land, was operated by 152 farmers in 1959 and produced 6,933 tons of forage and 5,984 bushels of coarse grain. Some 4,400 cattle and 335 sheep are owned by the farmers using this part of the Rush Lake project to produce the feed necessary to carry their livestock throughout the winter.

In the South Rush Lake project there are approximately 1,700 acres of irrigable land which are irrigated by spring flood from the main canal. During 1959, forty-six farmers produced 1,777 tons of forage and 3,330 bushels of coarse grain as supplementary feed for their 1,400 cattle and 325 sheep. An additional 535 acres were seeded to forage crops in 1959 making a total of 1,300 acres seeded to forage crops in the South Rush Lake area since 1956.

Development work on the North Rush Lake project in 1959 consisted of breaking 85 acres of land, scraper levelling of 75 acres in preparation for reseeding to forage crops, and seeding 475 acres of land which were prepared previously. Drainage on the project was improved by construction of 1 1/2 miles of new drainage ditch and the renovation of 7 1/2 miles of existing drain. New structures, bridges and culverts were installed by the P.F.R.A. project crew to improve and increase the irrigable acreage in both the North and South portion of the Rush Lake Project.

### Bow River Resettlement Project

To provide land suitable for resettlement of farmers from drouth areas on the prairies, the Government of Canada in 1951 purchased the Bow River Irrigation Project northwest of Medicine Hat in Alberta, and set aside 27,000 acres in the Hays District of the project specifically for this purpose. Actual settlement began in 1952. There are now 162 farm families settled in the district. Three of the families moved to the project from Saskatchewan in 1959. This now completes the resettlement program on the Bow River Project and no further movement of settlers to the Hays District is anticipated.

During 1959 the main point of interest was a change in land policy whereby provision was made for the original 120 acres of irrigable land per farm unit to be increased by 30 or 40 acres. The purpose of the revision was to help speed the rehabilitation of settlers in the district. In addition, special loans were made available in 1959 to assist farmers in the purchase of fencing material, building materials for the family dwelling, and breeding stock. It is anticipated that these new policies will provide the extra acreage needed to institute more effective weed control measures through summerfallow, encourage livestock production, and improve housing accomodation on farms throughout the project area.






# BOW RIVER PROJECT

## RESETTLEMENT-HAYS IRRIGATION DISTRICT

MARCH 31, 1960

### LEGEND

-  CANAL
-  ROAD
-  LOT BOUNDARY
-  DISTRICT BOUNDARY

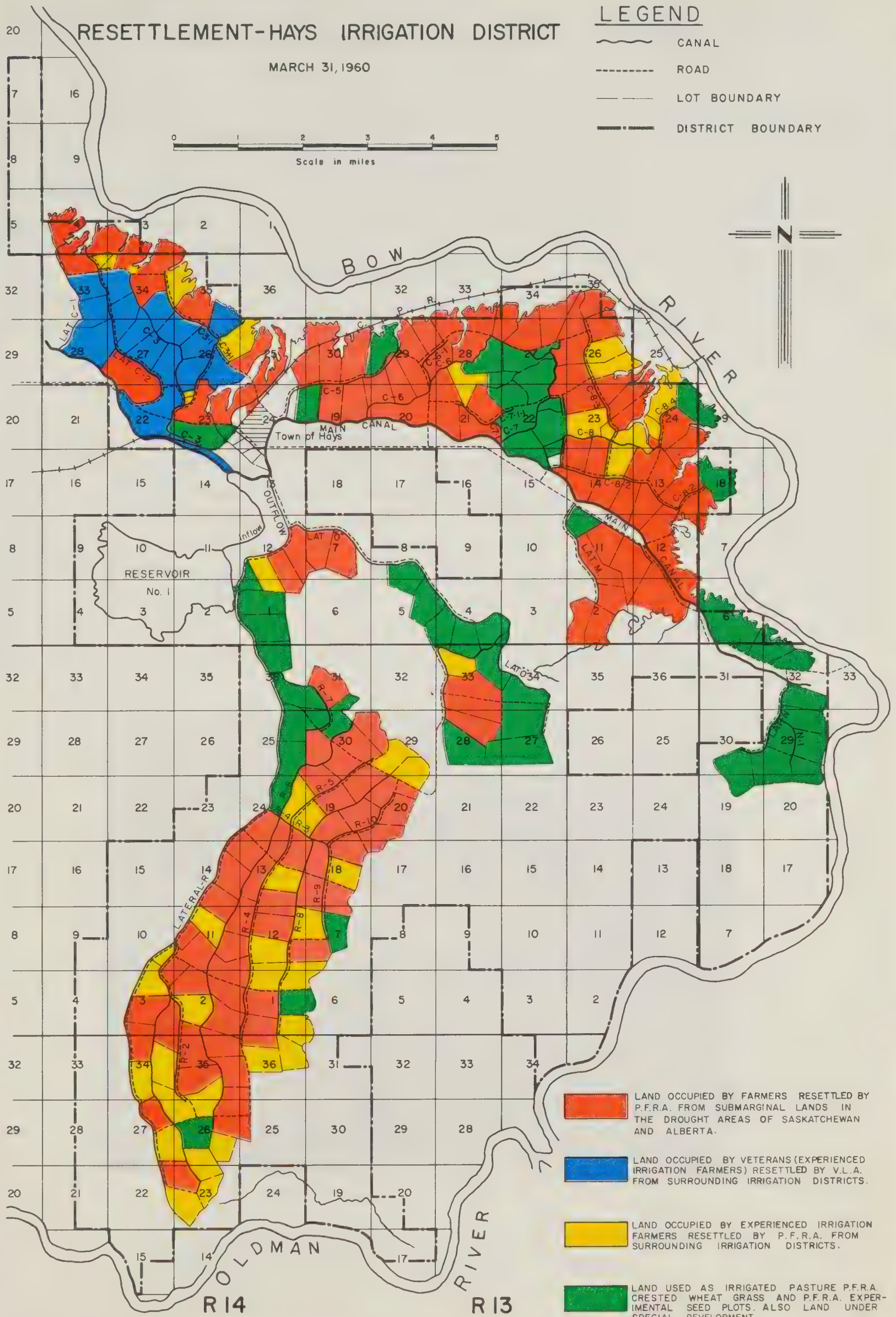
0 1 2 3 4 5  
Scale in miles



T 14

T 13

T 12







## MAJOR IRRIGATION and RECLAMATION PROJECTS

In addition to the water conservation and land use program established under the terms of the Prairie Farm Rehabilitation Act, the Government of Canada in recent years has made special provision for the development of large Irrigation and Reclamation projects throughout Western Canada. These major projects are usually undertaken on a cost sharing agreement between the Federal Government and the Provincial Government concerned. The Prairie Farm Rehabilitation Administration has been made responsible for Canada's part in the supervision, construction, and development of these projects which require special votes of Parliament for authorization.

### St. Mary Irrigation Project

The St. Mary Irrigation Project has been under construction since 1946. An agreement between the Government of Canada and the Government of Alberta provides that Canada will finance certain main reservoirs and connecting canals, while the Alberta Government is responsible for financing and developing the remaining works. Canada, however, does the engineering, design, and administration of construction for the whole project. In addition to this, Canada operates and maintains that portion of the project financed by the Federal Government, and is reimbursed by the Government of Alberta for such costs, not to exceed 25¢ per acre foot of water delivered to the provincial works.



An aerial photograph of the diversion weir and outlet of diversion canal constructed by P.F.R.A. on the Belly River in southwestern Alberta, St. Mary Irrigation Project.



When completed, the St. Mary Project is expected to contain nearly 500,000 acres of irrigated land, using all available water from the Belly and Waterton rivers, along with Canada's share of the St. Mary river. The project lends itself to stage construction which is an important asset because it takes time for a dry region to adjust itself agriculturally and economically to the addition of large acreages of irrigated land. It is expected that another six or eight years will pass before the final stage of construction is completed. Up to the present time works have been completed to serve 304,000 acres of land, of which 120,000 acres were previously irrigated with a limited water supply.

Capital funds expended by the two Governments to March 31, 1960 are approximately:-

Government of Canada (P.F.R.A.)	\$22,059,000.00
Government of Alberta	18,214,000.00

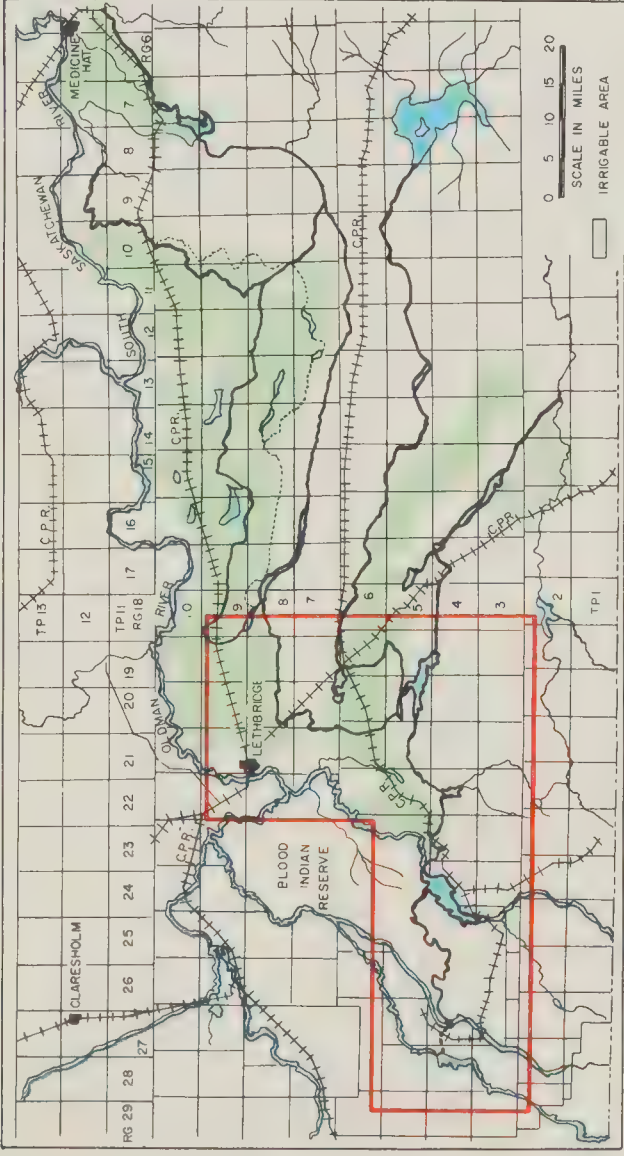
#### Investigations and Construction

In 1959 the engineering staff was engaged in further design and investigation of the Waterton Dam and appurtenant structures, as well as for the canal and structures required for diversion from the Waterton Reservoir to

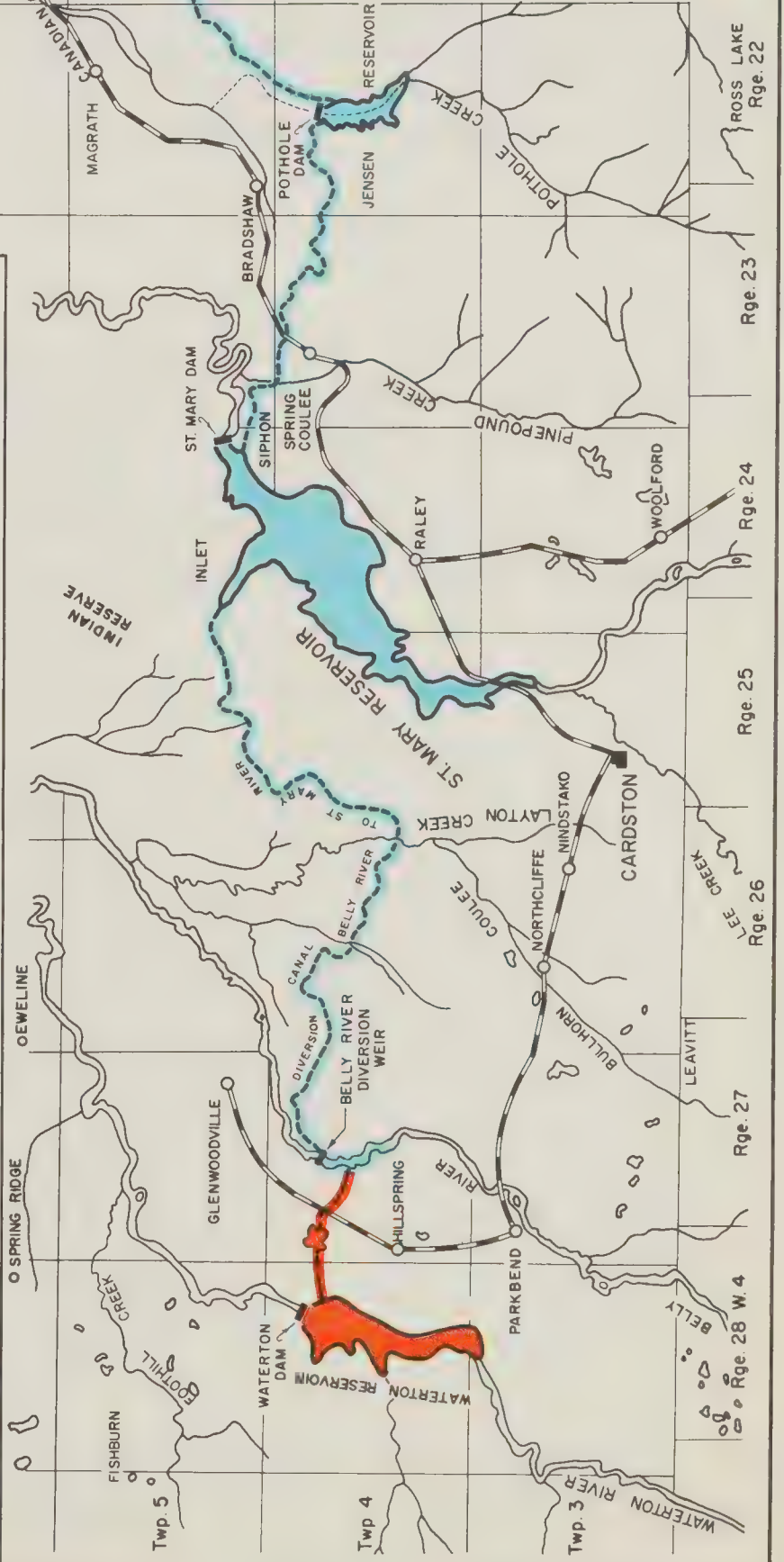


Interior view of river diversion tunnel under construction on the Waterton water storage and diversion project in south-western Alberta.





ST. MARY IRRIGATION PROJECT  
GENERAL PLAN



# WATER STORAGE AND SUPPLY FACILITIES PROVIDED BY THE FEDERAL GOVERNMENT MARCH 1960



## LEGEND

- CONSTRUCTION UP TO END OF FISCAL YEAR 1958-59
- UNDER CONSTRUCTION





the Belly Reservoir. Further field surveys were carried on in the southeast portion of the project. Construction during the year included the Waterton Diversion Tunnel, completion of the Highway #5 Bridge Contract, and completion of the United Irrigation District Canal Relocation Contract.

### Project Improvement and Maintenance

Minor alterations and additions to capital works already in operation are generally done by P.F.R.A. crews and equipment engaged in operation and maintenance on the project. Special work undertaken in 1959 included construction of open drains in Divisions 1, 2 and 3 to reclaim land damaged by seepage from the main canal, lining of a portion of the main canal to reduce seepage, and construction of a retaining wall and revised portal wall at the outlet of the St. Mary Diversion Tunnel. Maintenance work was confined mainly to replacing the clay lining in the main canal just below the St. Mary Reservoir. Other work included camp and reservoir landscaping and building maintenance.

### Project Operation

Approximately 54,000 acres, or an increase of 15% occurred in the acreage irrigated in the new areas of the project in 1959. As a result of dry weather during the growing season in the eastern part of the project, water consumption was up 25% over the previous year. In contrast, relatively wet weather was experienced in the western portion where irrigation has been well established, with the result that the total water consumption for the project was 27,000 acre feet less than in 1958.

The following table shows project development since 1952:-

<u>SEASON</u>	<u>New works Constructed to serve (acres)</u>	<u>Old district served approximately (acres)</u>	<u>Water delivered from St. Mary Res. (acre feet)</u>
1952	37,000	118,000	186,000
1953	54,000	118,000	196,000
1954	96,000	118,000	246,400
1955	141,000	118,000	190,000
1956	168,000	118,000	202,430
1957	176,000	120,100	314,492
1958	176,000	120,100	272,132
1959	184,000	120,100	245,260
1960	184,000		

The newly constructed canal from Belly River to St. Mary Reservoir was put into operation for the first time in 1959.

## Agricultural Development

Early frosts combined with unfavorable growing conditions contributed to a decrease in the production of specialized crops. The acreage of sunflower seed for oil production increased to some 8,600 acres in 1959. A proposal to establish a shortening plant at Lethbridge indicates a large expansion for this crop. The following table shows the development taking place in the Lethbridge area.

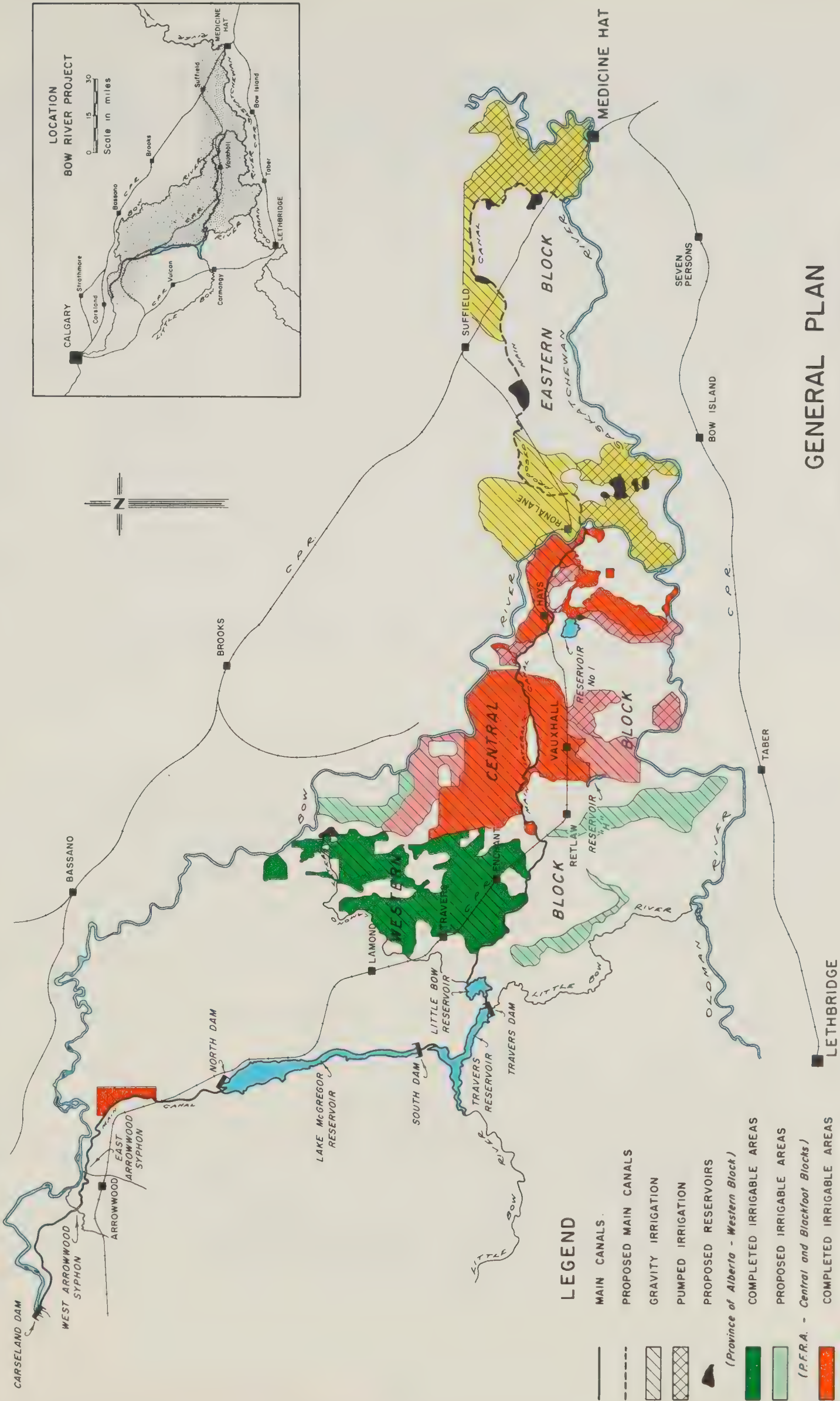
	<u>1957</u>	<u>1958</u>	<u>1959</u>
Green vegetables	1,200 acres	1,500 acres	900 acres
Potatoes	4,800 "	5,500 "	4,500 "
Canning vegetables	8,000 "	10,000 "	10,000 "
Sugar beets	38,000 "	38,000 "	35,000 "
Sunflower seeds		1,000 "	8,600 "

Another new development in specialized crops at Lethbridge is the processing of potatoes into frozen chips. This should result in an increase in the potato acreage.



A farmer and his family in the Taber district of the St. Mary Irrigation Project harvesting a commercial crop of beans grown under irrigation. Note sugar beet processing plant in background.





# GENERAL PLAN BOW RIVER PROJECT

MARCH 31, 1960







Livestock production increased by 4.3% over the 1958 figure. Handlings at Lethbridge have increased from a value of 16 million dollars in 1950 to over 22 million dollars in 1959. Much of this stock is raised and finished on irrigated acreage. Livestock sales at the Lethbridge stockyards since 1955 are shown in the following table.

Year	Cattle	Calves	Hogs	Sheep	% Increase over previous year
1955	46,815	10,008	55,863	12,094	
1956	54,735	12,048	61,155	12,595	12.7
1957	69,035	14,380	65,389	13,918	15.8
1958	63,282	17,583	89,810	13,769	13.4
1959	67,333	12,187	94,500	18,361	4.3
1959 (x)	20,058	4,648	43,900	27,447	

x - These figures represent "through sales", which are made elsewhere but pass through the Lethbridge yards. These are sales from the Lethbridge district.

### Bow River Irrigation Project

The holdings of the Canada Land and Irrigation Company were purchased in 1951 by the Government of Canada and now form the basis of the Bow River Irrigation Project. The Company had developed about 57,000 of the 240,000 acres of irrigable land associated with the project. The Government of Canada, through P. F. R. A. , and by agreement with the Province of Alberta, has undertaken renovation and enlargement of the existing works to extend irrigation to a larger portion of the total irrigable acreage.

#### Project Construction and Improvement

The basic renovation and extension work on the Bow River irrigation system was concluded in 1959 with completion of construction of Drop 7A on the main canal. Improvement and extension work in 1959 included construction of a new outlet structure for the West Arrowwood syphon, installation of a new check structure on the main canal to supply the Distributary 'Y' area, and levelling of 500 acres of land. The program of replacing wooden structures was continued in 1959 with the installation of 46 concrete structures and 70 constructed of galvanized iron pipe, concrete and wood.



Aerial view of Town of Hays in the Hays district of the Bow River Irrigation Project. Note main irrigation supply canal in right foreground and pattern of irrigated land in centre background.

Ref. No. 18020



Water supply facilities established by P.F.R.A. on an irrigated community pasture in the Hays district of the Bow River Irrigation project.

Ref. No. 18769



During the year irrigation was extended to a 3,000 acre area northwest of Hays known as Distributary 'Y'. Gravity laterals and two open drains were installed by contract while project crews built 36 regional structures. Twelve hundred acres in this area can be irrigated by gravity; the remainder requires a pump lift of 15 feet. To improve the drainage system, 113,300 feet of canals were cleaned, drain spoil banks were levelled and grassed, and 2,625 feet of tile drain were laid to reclaim farm land in a seepage area at Hays.

The demand for irrigation water was average for the year. Water was turned into the canal system on May 19 and shut off on October 20. During the year 651 farm units in the Vauxhall and Hays areas used 72,580 acre feet of water. Water delivered to the provincial Bow River Development is measured by automatic water recorders operated by the Water Resources Branch of the Department of Northern Affairs. For internal system operations, P.F.R.A. operates four canal flow stations and four reservoir level gauges.

The water level in Lake McGregor was raised 1.15 feet during the year to increase the storage capacity in the reservoir to 221,846 acre feet. Total water in storage on the project at March 31, 1960 was 275,241 acre feet or sufficient to supply the irrigation demand for one year without further diversion from the Bow River.

#### Agricultural Development

The severe winter resulted in winter killing of 75% of the alfalfa crop and all the clover. Rainfall for the season was above normal and was sufficient to give good yields on dry land. Where augmented by irrigation, crop yields were above average. Hail again damaged crops in the Hays district causing from 25 to 100 per cent damage on forty farms northwest of the town.

Sunflowers and soybeans were grown on a test basis in 1959. The dehydrating plant established by the Alberta Dehydrating Company at Vauxhall in 1959 produced 1,500 tons of dried alfalfa and processed 500 tons of potatoes during the year. In the off season the plant grinds, mixes and pellets feed for livestock. The livestock industry continues to be the stabilizing influence on the Bow River Project.

#### South Saskatchewan River Project

On Friday, July 25, 1958, the Government of Canada signed the agreement previously ratified by the Government of Saskatchewan, which authorized commencement of construction of the South Saskatchewan River Project. This is a large multi-purpose water conservation scheme on the South Saskatchewan River in south-central Saskatchewan, the purpose of which will be to make more efficient use of the water resources in this major prairie river through irrigation, power, stream flow regulation, municipal and urban water supply, and recreation.





Aerial view of construction area South Saskatchewan River Dam project viewed from the north. Note P.F.R.A. construction headquarters at extreme left of photograph.

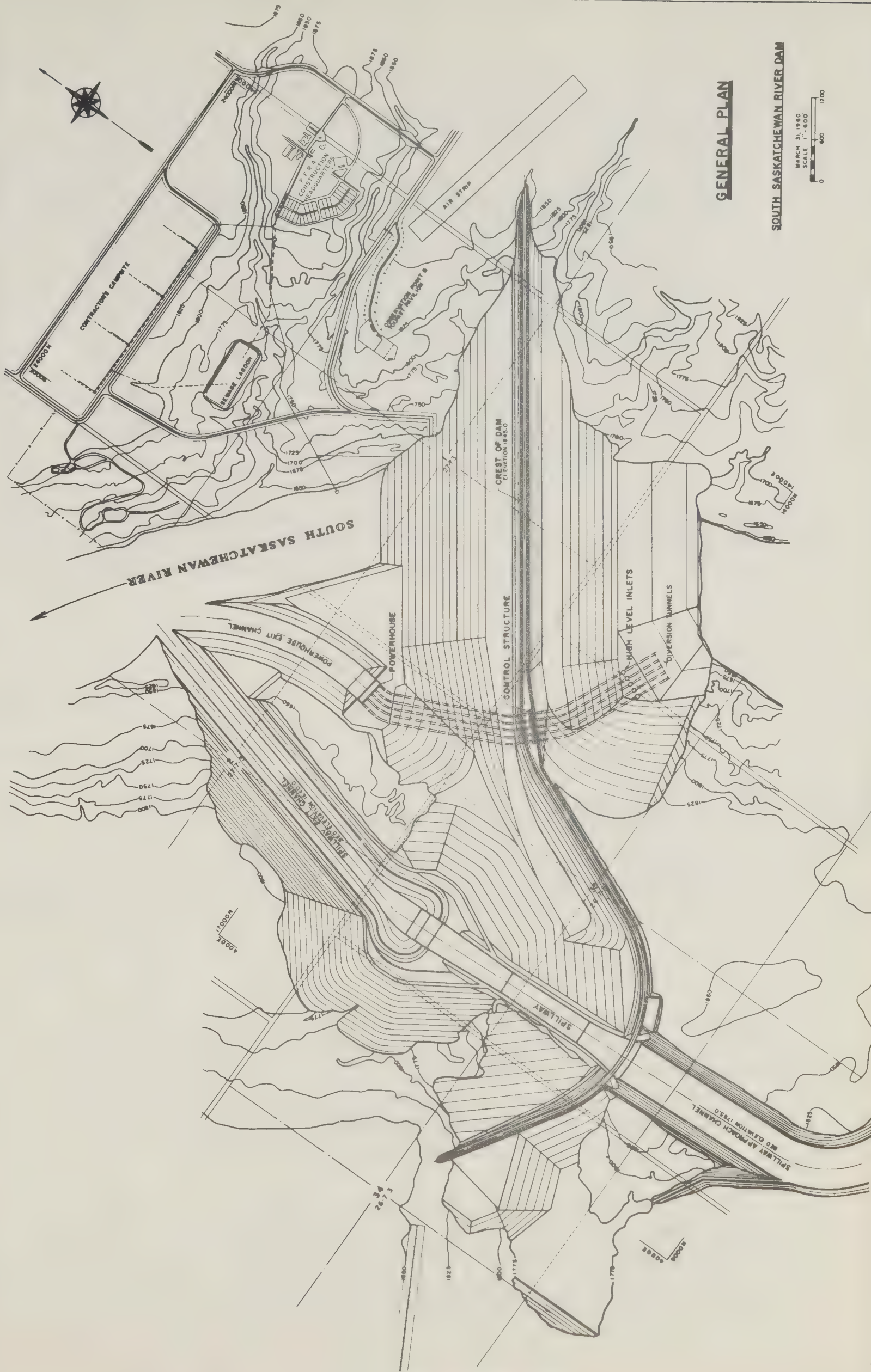
Ref. No. 19825

Control of the river will be achieved by construction of 2 dams; the major one on the South Saskatchewan River midway between the towns of Elbow and Outlook; the other at the divide between the valleys of the South Saskatchewan and the Qu'Appelle.

Under the terms of the Agreement it is provided that -

1. Canada and Saskatchewan will share in the cost of the construction of the dam and reservoir, 75 per cent thereof to be borne by Canada and 25 per cent by Saskatchewan, with the share of cost borne by Saskatchewan not to exceed \$25,000,000.
2. Canada will supply and cover the cost of all administration, engineering services and supervision of the work associated with dam construction and creation of the reservoir.
3. Canada will bear all costs of maintenance of the dam and reservoir until six years from the day the dam is completed. For four years thereafter, Canada and





**GENERAL PLAN**

**SOUTH SASKATCHEWAN RIVER DAM**

MARCH 31, 1960  
SCALE 1" = 600'





Saskatchewan will share equally the cost of maintaining the dam and reservoir.

4. Saskatchewan will be responsible for and bear the cost of the construction of the power facilities for the generation and transmission of hydro-electric power with the exception that Canada will pay 25 per cent of the cost of constructing and installing power penstocks of a size and capacity necessary to produce 200,000 horsepower at minimum operating head.
5. Saskatchewan will assume all responsibility for the construction, operation and maintenance of all the irrigation works associated with the project.

At the time of the signing of the Agreement by Canada and Saskatchewan, the estimated cost breakdown between the two governments for the main dam and reservoir was as follows:-

	<u>Canada</u>	<u>Saskatchewan</u>	<u>Total</u>
Dam and Reservoir	\$72,030,000	\$24,010,000	\$96,040,000
Engineering and Administration	<u>7,500,000</u>	<u>                    </u>	<u>7,500,000</u>
TOTAL	<u>\$79,530,000</u>	<u>\$24,010,000</u>	<u>\$103,540,000</u>

The total cost of constructing and installing power penstocks was estimated at \$7,362,000. On this basis Canada's contribution of 25% would be approximately \$1,840,500.

#### Construction

Activities on the South Saskatchewan River project to date have been confined to construction on the main dam on the South Saskatchewan River which is being supervised by P.F.R.A. A total of 15 contracts have been awarded valued at approximately 24 million dollars. Of this amount an estimated six million dollars of contract work has been carried out and 7 of the 15 contracts awarded have been completed.

Construction activity during the 1959-60 fiscal year has involved mainly completion of work on access roads to the damsite, construction of headquarters facilities, establishment and operation of an aggregate processing plant, erection of the construction bridge, and work on the first two major earth moving contracts which have been awarded on the main embankment of the dam.



Heavy Caterpillar equipment moving earth on Embankment Stage 1 contract, South Saskatchewan River Dam Project.

Ref. No. 19026

A summary of the work by projects is given in the following.

East Access Road (Contract 1) - Work on this contract, involving the construction of approximately 13 miles of road from the damsite east to No. 19 Highway, commenced late in September 1958 and was completed May 30, 1959.

Processing of Concrete Aggregate (Contract 2) - Construction commenced on this contract June 1959 and except for a number of interruptions due to breakdowns and re-arrangement of equipment, continued throughout the summer until November 13, 1959 when operations were discontinued due to freezing weather conditions. The total amount of aggregate processed during this period amounted to 208,212 tons separated into fine aggregate and three different sizes of coarse aggregate.

Construction of Headquarters Services (Contract 3) - Items of work under this contract included installation of a complete water and sewerage system, construction of gravelled roads within the construction headquarters area, ditches, and concrete sidewalks. Construction work began November 1958 and was completed September 30, 1959.



Construction Headquarters Buildings (Contract 4) - This contract covered construction of forty housing units and five headquarters buildings, including six types of housing units, a staff house, an engineering building, an assembly hall, a field laboratory, and a combined garage, firehall, and warehouse, commenced in December 1958 and was completed by November 30, 1959.

Construction Bridge Substructure (Contract 5) - Work on this contract, involving construction of 4 river piers and the west abutment substructure for the construction bridge, started in December 1958, and was completed May 1959.

Embankment - Stage 1 (Contract 6) - This contract was awarded in February 1959 and involves construction of the embankment on the east abutment of the river to approximately one half the final height of the dam. Work progressed satisfactorily during the summer season. Considerable delay was experienced during the fall, however, due to adverse weather conditions. Placing of impervious fill was discontinued in October 1959. Hauling and placing of pervious fill continued uninterrupted through the winter period. The contract is now approximately 50 % complete.



Erecting steel superstructure for construction bridge, South Saskatchewan River project, during the winter of 1959.



North Access Road (Contract 7) - This contract covers construction of a road extending approximately 15 miles north from the damsite to Broderick on Highway 15, and access roads to the construction area. This operation started early in April 1959 and was completed by July 31 of the same year.

Bridge Superstructure (Contract 8) - Work under this contract includes construction of 4 approach piers and the complete superstructure required for the bridge. By March 31, 1960 all the piers and the structural steel for the 4 main spans were completed.

Embankment - Stage 2 (Contract 9) - Included in this contract is construction of the main dam embankment on the west abutment, extending to a point about midstream in the river, to approximately half the height of the dam. The main items of construction include excavation of approximately 18,000,000 cubic yards of earth material and placement of 14,000,000 cubic yards of compacted embankment. Work commenced on June 12, 1959 and satisfactory progress has been made to date with the contract to the end of the year about 21 % complete. In the early stages, work was confined largely to excavating waste material from embankment foundations and borrow areas. A perimeter dyke was then built around the construction area in the river section and sand was hauled in to form the base for the earth fill. When this was completed, placing of impervious embankment proceeded as well as excavating downstream filter trenches, and backfilling with select pervious material. Although placement of impervious embankment terminated at freeze-up, placing of pervious fill and hauling of stripping material to waste areas continued throughout the winter.

Well-point Water Supply (Contract 10) - The above contract called for construction of a well-point water supply system to serve the Construction Headquarters. The contract was awarded on March 23, 1959 and work was completed by the end of June 1959.

Water Supply Pumping Equipment (Contract 11) - Pumping units ordered under this contract arrived on the site August 1959. Installation and testing of the pumps, however, were not completed until the latter part of February 1960.

Tourist Pavilion (Contract 12) - This contract provides for construction of a modern building at the site to provide a safe place for visitors to view construction activities on the dam. Space is provided to house models and other displays of the construction, and benefits to be derived from the South Saskatchewan River Project. Construction work on the building started in September 1959 and with the exception of some exterior painting still to be done when weather conditions permit, was completed by December 31, 1959.

Downstream Tunnels (Contract 14) - The contract for this work, which includes excavation of approximately 10,000 feet of tunnel 20 feet in diameter;



lining of tunnels with 30 inch reinforced concrete, installation of steel lining in tunnels and construction of tunnel portal sections, was awarded on February 29, 1960. Work on this contract is scheduled to commence during July 1960.

Supply of Ring Beams (Contract 15) - the Company contracted to supply, fabricate, deliver and stockpile the 5,500 structural steel ring beams specified under this contract, began operations in January 1960. Activity to date has been confined to establishment of the company's plant at Moose Jaw. It is anticipated that delivery of ring beams to the damsite will begin shortly.

Highway Revision - Birsay to damsite (Contract 16) - This contract, involving construction of approximately 15.1 miles of new road, is a portion of the construction required to revise Highway #45 which will be inundated by the reservoir. No work on this contract, which was awarded November 12, 1959, has been carried out to date.

#### Public Relations

Although actual construction work on the dam began the preceding fall, a ceremony was held at the damsite on May 27, 1959 to officially mark commencement of construction on this major project. An estimated 14,000 people turned out to witness the ceremony which was highlighted by setting off a dynamite blast triggered by the Prime Minister of Canada.

It is estimated that during the year there were approximately 18,000 visitors to the damsite, in addition to those present at the Official Opening. Actual counts in the months of heaviest tourist traffic, July, August and September, showed as many as 1,500 visitors on most Sundays. An estimated 80% of these were from points within a radius of 150 miles of the damsite. The remaining 20% came from other parts of the province, from eastern and western Canada, and a few from the United States and abroad. Also several official tours were conducted during the year.

#### Pre-Development Farm

The Pre-Development Farm near Outlook, Saskatchewan, contains about 155 acres of sandy loam soil. The project was established in 1949 to serve as a pilot model for demonstrating cropping and irrigation practices which might be applicable to future irrigation development in the area.

Ten fields of 10 to 12 acres each were set out in a ten-year rotation with six years in forage crop, three in cereal and one in potatoes. Another area of 24 acres was devoted to irrigated pasture, the remainder being used for farmstead and tree belt. Irrigation water is pumped from the Saskatchewan River and distributed by both gravity and sprinkler methods.

The relative novelty of seeing crops irrigated in a dry farming area has always created public interest in the Pre-Development Farm. Now that farmers realize the possibility of large scale irrigation in the area, their interest has become more intense and inquiring. The number of visitors to the farm increased considerably in the present year and the farm manager was asked to attend local study groups to discuss irrigation, farm practices, crop rotation, and management problems. Some of the cropping methods and farm practices have been modified to better illustrate points which seemed to be of most interest. The nearby experimental plots operated by the Research Division provide a convenient complement to the cropping practices on the farm.

The following table shows crop yields for 1959, the average yields obtained over the past 4 years, and the average amount of irrigation water applied.

<u>Crop</u>	<u>Yield/acre 1959</u>	<u>Average/acre 4 years</u>	<u>Inches of water applied/acre</u>
Wheat	52 bus.	45 bus.	7 1/2 in.
Oats	84 "	90 "	7 1/2 "
Barley	88 "	64 "	10 "
Potatoes	8.2 tons	9.6 tons	8 "
Hay	2.8 "	3.4 "	11 "
Pasture			12 "

Yields of cereal crops for 1959 were near or better than average, but potatoes took a slight drop in production. Hay yields were also lower due to losses incurred as a result of heavy rains at the time of the first cutting in June. There has been no satisfactory explanation of the lower average yield of potatoes on the farm. The matter has been referred to soil and fertilizer specialists for study.

Of the cereal grain produced each year, a percentage is retained for seed, about two-thirds is fed to livestock on the farm, and any surplus is used by the Community Pasture Branch of P.F.R.A. A full scale livestock enterprise would use nearly all the grain and hay produced on the farm and utilize the manure as fertilizer.

Potatoes are marketed in quantity to local stores and wholesalers. No provision has been made for processing for retail trade as this is not related to the primary purpose of the farm.

The irrigated pasture was utilized during the year for the grazing of 40 head of grade steers purchased at Saskatoon stockyards in late February 1959. The steers were fed hay and grain until grazing was available in May. During the period May 15 to September 15 these steers grazed on 18 acres



and had grain and hay available from self feeders. They were then sold when their net weight was 1,000 lbs. Sixteen were sold on September 15, twenty on November 1, and 4 on December 10. The average gain in weight per animal was 410 lbs. The gain attributed to grazing, amounted to 513 lbs of beef per acre. Plans are to repeat this operation in 1960. In this case, however, 50 steers will be used. With 40 head it has been found that the pastures are not being used to full capacity.

### Buffalo Pound Lake Water Supply Project

Buffalo Pound Lake, located in the upper Qu'Appelle Valley about 20 miles north of the city of Moose Jaw, is one of the principal sources of urban water supply for the cities of Regina and Moose Jaw. Through an agreement with the Province of Saskatchewan, the Government of Canada has accepted the responsibility for maintaining the water level of the Buffalo Pound Lake Reservoir.

Pending completion of the South Saskatchewan River Dam, the level of Buffalo Pound Lake is to be maintained by supplementing the flow of the Qu'Appelle River with water pumped from the South Saskatchewan. Work on construction of the pumping plant and conveyance system was begun in 1955 and completed in June 1958.

During 1959-60 the pumping season started on May 20 and ended on October 3. An estimated 18,933 acre feet of water were pumped from the South Saskatchewan River, of which approximately 9,361 acre feet reached Buffalo Pound Lake. Through the use of gauging stations it was found that about 42 % of the water was lost in the Eyebrow Lake area. In an attempt to reduce this loss the construction of a diversion canal around the lake was proposed. Tenders for this work were called in November 1959 for construction the following spring before commencement of the 1960 pumping season.

Also included in this fiscal year's work was the installation of some 34,620 square feet of plastic lining over a section of the low level canal leading from Pump House No. 1, where seepage had become a problem. In addition, some sloping of the hill above Pump House No. 1 was carried out during the year as well as a small amount of maintenance work on Moose Jaw Creek Diversion into Buffalo Pound Lake.

### Emma Lake Conservation Project

The purpose of this project is to provide storage in Anglin Lake and a pumping pond from which water may be pumped into Emma Lake to restore and maintain the level of this lake. Supervision of the construction of this project, which is located in the Prince Albert National Park, is being provided by P.F.R.A. for the Federal Department of Northern Affairs and National Resources.



The contract for the work was awarded on October 22, 1959. Due to freezing winter conditions, however, only a preliminary start could be made and construction was shut down three days later.

### Saskatchewan River Reclamation Project

Between Tobin Rapids in Saskatchewan and Cedar Lake in Manitoba, the vast Saskatchewan River Delta contains approximately two million acres of land which over the years, many authorities have felt can be reclaimed and converted into productive farm land. A narrow, north-south ridge on which the Town of The Pas is located, divides the delta area into two sections. The Sipanok and Pasquia areas, lying to the west of this ridge, have been the subject of extensive study and development by P. F. R. A. since 1950. East of the ridge lies the Moose Lake area, which during 1959 has been the subject of a comprehensive program of field and office investigations.

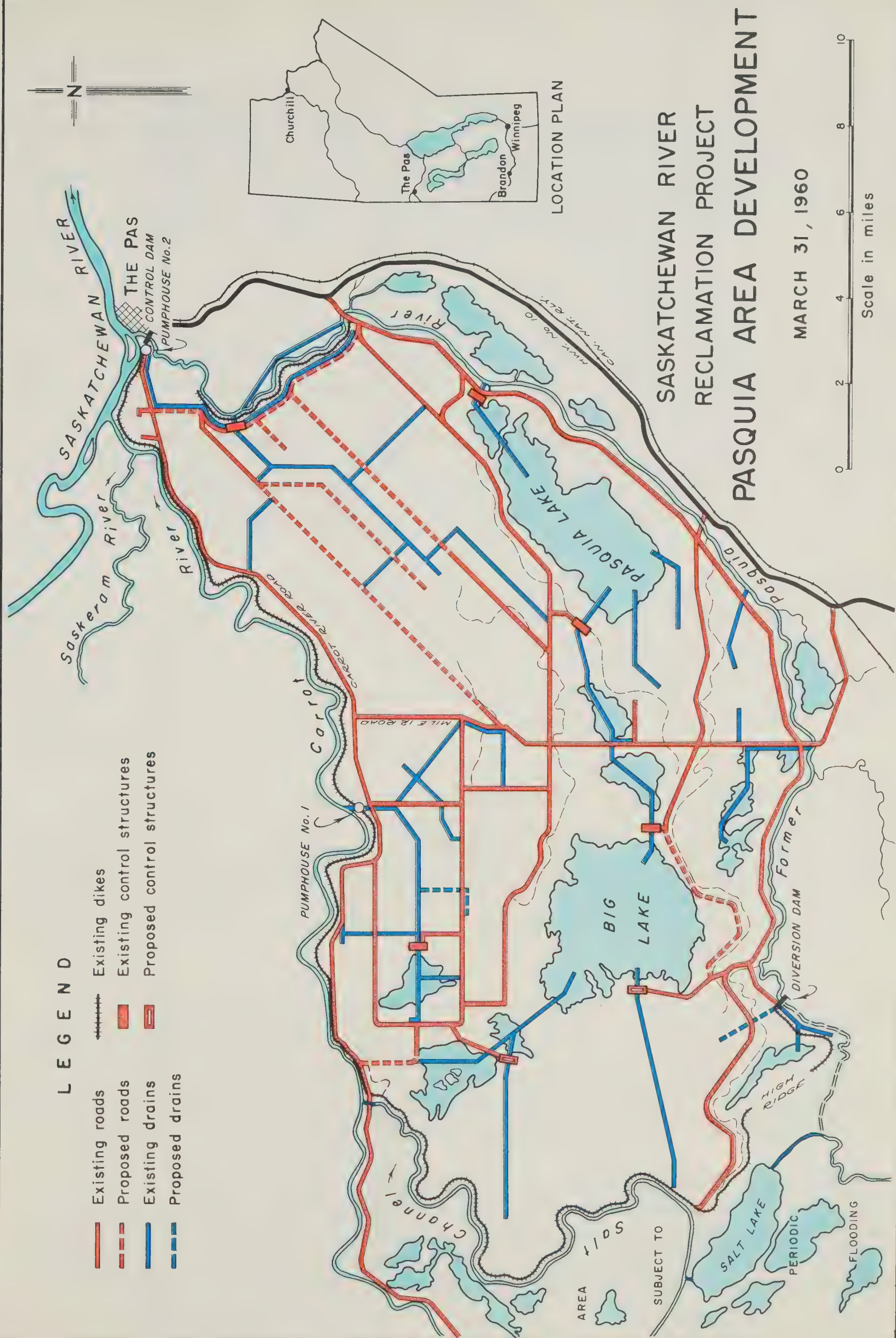
#### Sipanok Area

This portion of the delta lies mostly in the Province of Saskatchewan and contains the bulk of the potentially arable land. It extends approximately from Squaw Rapids to The Pas, and is bordered on the north and south by the Saskatchewan and Carrot Rivers, respectively.



Aerial photograph of general area surrounding the town of The Pas in northern Manitoba, showing Carrot River Dyke and Carrot River Road in foreground and Pasquia River Control Dam near town limits.









The Sipanok Area and its reclamation possibilities were the subject of detailed topographic, hydrometric and office examinations between 1954 and 1957. Since completion of the report on this project in 1956, regular hydrometric and sediment transport observations have been maintained on a limited scale. A metering station on the Saskatchewan River at The Pas was operated during the summer months to gather desired information.

### Pasquia Area

The Pasquia Area, roughly triangular in shape, having a total of 135,000 acres, is located southwest of the Town of The Pas, and is bounded by the Manitoba-Saskatchewan border on the west and the Pasquia and Carrot Rivers on the other two sides. Since 1953 the combined efforts of the Federal and Provincial Governments have been directed toward the planned development of the Pasquia Area. The work will have the twofold purpose of creating about 110,000 acres of land suitable and safe for agriculture, and of acting as a pilot project for the possible future reclamation of more of the Saskatchewan River Delta.

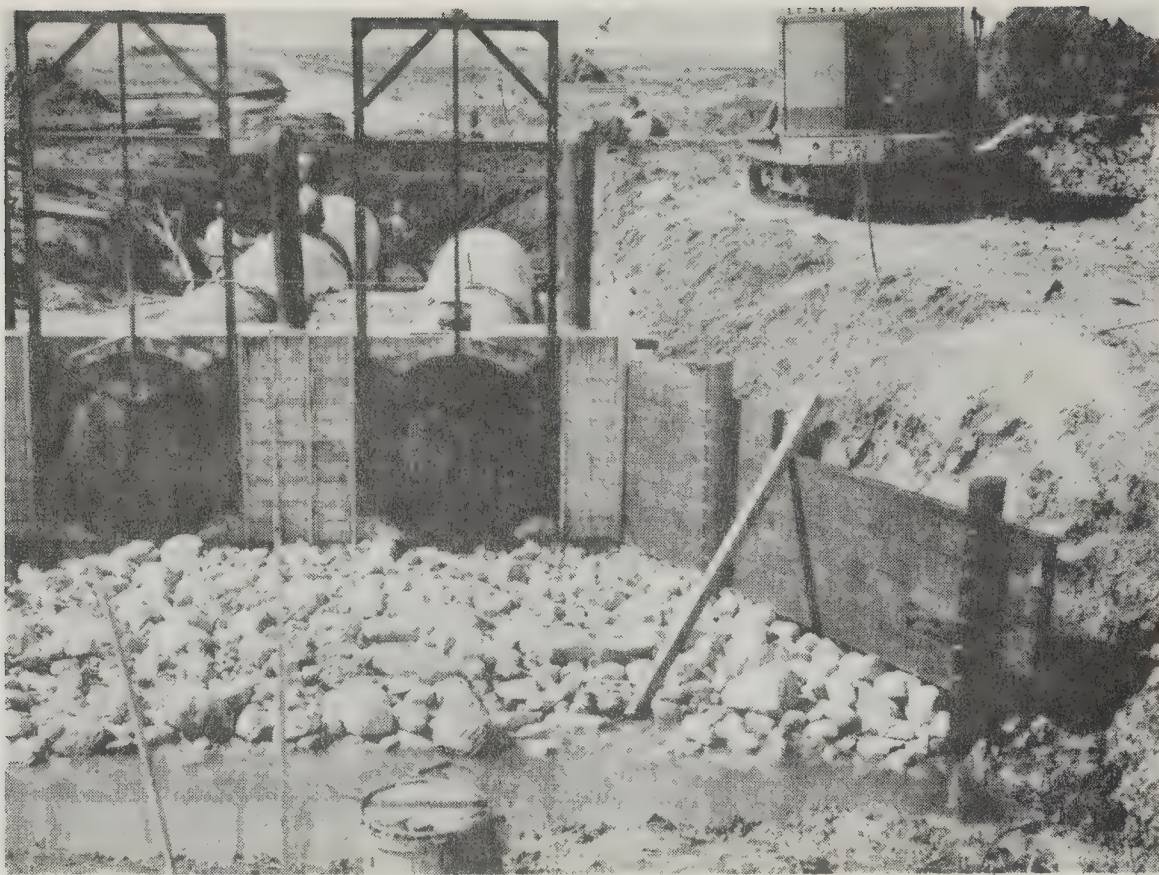
Development has taken place in three stages involving; first, dyking off the north and west sides of the area and diversion of the Pasquia River around the dykes; second, installation of a system of controlled internal primary drainage; and third, construction of a network of roads and secondary drains. Figure 4 depicts the present status of the over-all scheme, and indicates the amount of work that has been done in the Pasquia Area during the 1959-60 fiscal year.

All preliminary survey and design work leading to this development has been done by P. F. R. A. The layout of the system of roads and drains has been the outcome of close co-operation between P. F. R. A. and the Lands Branch, Manitoba Department of Mines and Natural Resources. By agreement, construction of the first two stages of reclamation was the responsibility of P. F. R. A. ; the Province of Manitoba providing the road and secondary drainage systems.

The 1959-60 fiscal year saw road and drainage construction going ahead under the terms of five separate Provincial contracts. Four road contracts resulted in the completion of 30 miles of road, while 14 miles of drain were constructed under one drainage contract. A portion of the contract work represents the clean-up jobs originally let in 1957. At March 31, 1960, part of the construction called for by 1958 and 1959 contracts remained to be finished.

Two P. F. R. A. crews maintained records of water level and stream discharge within and around the Pasquia Area. The internal drainage of the area depends on this hydrometric work, and is governed by the management of a system of six control structures and two pumping plants. During the 1959 runoff season, these controls were operated by P. F. R. A. personnel in such





Control gates under construction on one of the principal drainage channels in the Pasquia Development area of the Saskatchewan River Reclamation project.

Ref. No. 13899

a way as to prevent outside water from entering the project area, and interior drainage from interfering with construction activities.

Other items of work completed during the year included levelling and trimming spoil banks, improvement of certain culvert installations, and seeding of nearly 40 miles of road, dyke, and waste areas.

#### Moose Lake Area

The Moose Lake Area extends from The Pas to Cedar Lake, and is bounded on the north by the Canadian National Railway's line to Churchill, Manitoba, and on the south by the Summerberry River. In 1958, P.F.R.A. was requested to perform field and office investigations necessary to permit the preparation of a preliminary report on reclamation possibilities in this easterly part of the Saskatchewan River Delta.

All data available from earlier Federal and Provincial studies were compiled and a winter survey program, sufficiently comprehensive to provide missing information, was drawn up. Four survey parties, working from camps in the Moose Lake Area, completed this assignment between January 6 and March 14, 1959. The job included control levels, channel cross sections,



dyke location profiles, and soil sampling, plus control structure site surveys. This field work is outlined here since it was omitted from the report describing the operations of the 1958-1959 fiscal year.

The results of this and previous surveys were combined in the Winnipeg office to form the basis of study which required the services of an engineer for four months.

### Assiniboine River Project

Along the Assiniboine River between Portage la Prairie and Headingly in Manitoba, a continual problem of flooding has faced farmers and communities over the years often causing considerable damage to land, buildings and other property in districts adjacent to the river.

During the early years the Federal Department of Public Works looked after most of the flood protection work that was carried out in the area. In 1950, however, responsibility for the work was transferred to the Canada Department of Agriculture under P. F. R. A. and has remained under this jurisdiction ever since.

Flood control activities carried out by the P. F. R. A. along the Assiniboine have mainly involved construction of dykes and channel improvement work. In addition to this, however, a considerable amount of survey has been conducted both on the upper and lower reaches of the river, studying potential storage sites that would provide more effective stream flow regulation throughout the river system.

### Assiniboine River Dykes

The final gaps in the Assiniboine River dykes below Portage la Prairie, Manitoba, were closed during the year requiring construction of approximately 4,000 feet of dyke along the north bank of the river. Heavy bush along the location of this dyke was removed by hand labour preliminary to construction.

Elsewhere along the dykes, borrow pit drainage and trimming were completed and a total of 40 acres of dyke right-of-way was seeded to grass. In addition, two drain culverts, one at the outlet of Sayer Creek into the Assiniboine River and a second on Mill Creek at its junction with the river, which were damaged by floods earlier in the year, were repaired and improved.

### Russell and Shellmouth Projects

These two proposed reservoirs are located on the Assiniboine River upstream of the confluence of the Qu'Appelle River near the Towns of Russell and Shellmouth in Manitoba. The two schemes, one the alternative of the other, have been the subject of considerable study for several years. Interest in them

was revived with the submission to the Province of Manitoba, of the Manning Royal Commission's report on the cost-benefit aspects of flood control proposals set forth in the Red River Basin Investigation Report. The Russell Project was one of two principal recommendations by the Commission for flood control work on the Assiniboine River.

Investigations concerning the projects carried out during 1959 were principally confined to office studies. A complete re-appraisal of the Russell project was undertaken during the year and a similar study commenced on the Shellmouth proposal.

#### Holland Dam

Routine engineering investigations carried out in the Assiniboine River Valley revealed that topography in the vicinity of Holland, Manitoba, was favourable for the creation of a large storage reservoir. Studies were therefore carried out to see whether development in this area presented an alternative to the Portage Diversion flood control scheme, which would have the added advantage of being capable of storing excess waters during heavy flows in the river, for beneficial use downstream.

These studies which were begun in 1958, are continuing.

#### Northwest Escarpment and Interlake Reclamation Projects

The work described in this section is located along the Manitoba Escarpment on watersheds originating out of the eastern and northern slopes of the Riding, Duck and Porcupine Mountains, and in the southern part of the area between Lakes Winnipeg and Manitoba. These projects all come under the terms of the Federal-Provincial Northwest Escarpment and Interlake Region Agreement.

This agreement, originally entered into in 1949, and renewed annually with minor modifications up to and including 1959, authorizes equal sharing by the Governments of Canada and Manitoba of the first costs of mutually agreed-upon flood and erosion control works. At the time of each renewal of the agreement, a limit is set on the amount of the Federal contribution, and the area within which works may be undertaken is broadly defined. During the decade just past, projects having a total cost of approximately \$2,000,000 have been undertaken on this co-operative basis.

Individual works have been designed and constructed under the direction of the engineering staffs of either the Federal or Provincial Governments. Under the agreement the costs of these services are not shared but are paid by the agency actually doing the work. To date, P.F.R.A. has had responsibility for the engineering on all projects except those involving headwater



storage reservoirs on streams in the Duck and Porcupine Mountain Provincial Forest Reserves. Engineers of the Manitoba Department of Mines and Natural Resources were in charge of the latter work until this year. The recent Provincial reorganization has resulted in this portion of the program being taken over by the Water Control and Conservation Branch, Manitoba Department of Agriculture.

#### Northwest Escarpment

During the year major attention in this area was devoted to the Wilson Creek Experimental Watershed Project located on the east escarpment of Riding Mountain, southwest of the Village of McCreary, Manitoba.

A nine square mile area of wooded watershed on the headwaters of Wilson Creek lying inside the boundaries of the Riding Mountain National Park was selected in 1957 as being typical of many flood producing basins along the eastern slopes of the Riding, Duck and Porcupine Mountains. Since early 1958 a program of observation and experimentation has been initiated within the area under the direction of the joint Federal-Provincial Committee on Headwater Flood and Erosion Control. The object of this work is to discover the remedial effect that headwater control can have on



Flash floods originating off the eastern slopes of the Riding Mountain have created erosion problems such as are shown in the above picture on Wilson Creek. Studies are currently being undertaken to rectify this problem.





The contouring and seeding to trees on shale banks on Wilson Creek are some of the methods currently being investigated to stabilize such areas on the eastern slopes of the Riding Mountains.

Ref. No. 51978-8

flood and erosion problems in the lower reaches of such streams, and to evolve methods of control which can be applied to other similar basins on the escarpment. Work to date has consisted mainly of construction of access roads and trails, installation of hydrometeorological observational equipment, mapping of soils and vegetation, and production of reliable topographic plans of the area. Some experimental slope contour work was also carried out during the current year.

Other activities in the area during the year included a continuation of experimental bank protection work on the headwaters of Edwards Creek and investigations concerning a build-up of sediment in Lake Dauphin at the outlet of the Edwards Creek-Jackfish Creek floodway channel. Surveys were also continued in the Pine River and Woody River districts of the Northwest Escarpment Project in an attempt to find a solution to the serious flood problem which exists along the course of these two water systems.

### Interlake Region

Principal development activity in this region during the year has been in connection with the construction of the Burnt Lake Drain begun by P. F. R. A. in 1958.



Burnt Lake lies in a marshy area of low agricultural productivity located northeast of Lundar, Manitoba, on the Lake Manitoba side of the interlake divide. The Burnt Lake Drain connects this marshy area with an existing drainage channel named Swan Creek Drain, by way of a new ditch crossing many smaller sloughs, which empties into Lake Manitoba. The contract covering this work under the Northwest Escarpment-Interlake Agreement called for enlargement of the existing Swan Creek Drain and its extension through construction of a new ditch to Burnt Lake. Two construction seasons were required to complete the work. The downstream end of Swan Creek Drain was enlarged for 12 miles in the late fall of 1958. Excavation was resumed in May 1959 and by mid-August the remaining 5 miles of the 17 mile drain, and 13 miles of new drain were completed. Also included in the program of work during 1959 was construction of 3 earth fill road crossings, 5 municipal bridges, and 9 concrete-based ford crossings.

Other projects which were studied during the year included the Icelandic River Project involving the control of floods on the Icelandic River between Arborg and Lake Winnipeg in Manitoba, and the Fish-Dennis Lakes Flood Control Project located just south of the Icelandic River Basin. On both projects the studies undertaken included an appraisal of flood damage and agricultural benefits as well as comprehensive topographical surveys.



Culvert near outlet end of the Burnt Lake drainage channel in the Interlake region of Manitoba.



## Rivers Water Storage Project

Construction of Rivers dam on the Minnedosa River near the town of Rivers in Manitoba began in June of 1958 following a request received from the Manitoba Government in 1956 for development of this general purpose water storage project. The total estimated cost of the structure, which is expected to take two to three years to build, is over one million dollars. Construction began in June 1958 and is now 90 % complete.



Work crews engaged in the construction of the spillway for the Rivers Water Storage Project.

Ref. No. 51957-1

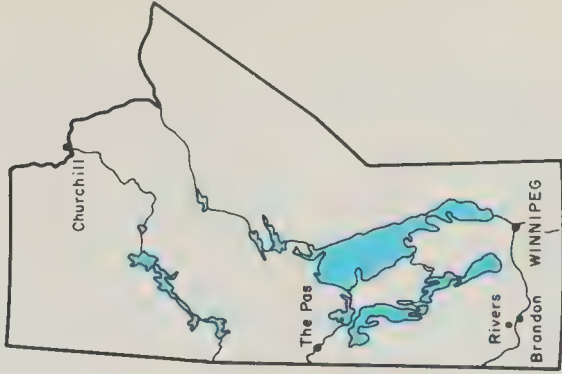
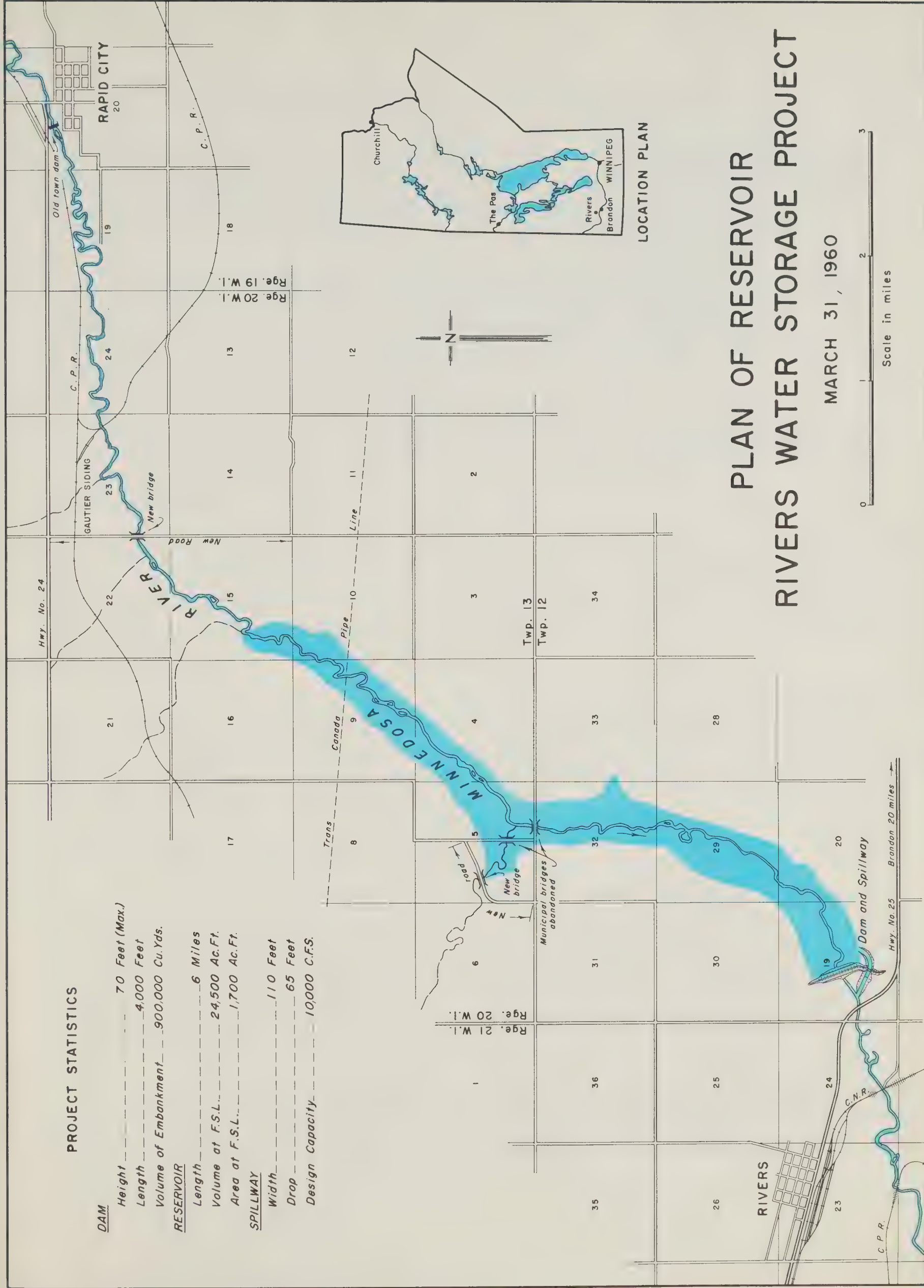
The dam, which will be approximately 4,000 feet long and 75 feet high, will create a reservoir covering 1,600 acres of land and possess a storage capacity of around 25,000 acre feet of water. Located on a main tributary of the Assiniboine River, this project will provide a reliable supply of water for livestock in a large area surrounding the project which is served by the reservoir. The Rivers Project will also be of sufficient size to make water available for domestic use in nearby urban and rural areas, and in addition, assist in streamflow regulation in both the Minnedosa and Assiniboine Rivers.

Details of construction during the current fiscal year included completion of construction on the spillway, placing of approximately 75 per cent of the required fill in the embankment, and completion of about 35 per cent of the riprap.



# PROJECT STATISTICS

<u>DAM</u>	
Height	70 Feet (Max.)
Length	4,000 Feet
Volume of Embankment	900,000 Cu. Yds.
<u>RESERVOIR</u>	
Length	6 Miles
Volume at F.S.L.	24,500 Ac. Ft.
Area at F.S.L.	1,700 Ac. Ft.
<u>SPILLWAY</u>	
Width	110 Feet
Drop	65 Feet
Design Capacity	10,000 C.F.S.



LOCATION PLAN

## PLAN OF RESERVOIR RIVERS WATER STORAGE PROJECT

MARCH 31, 1960







## British Columbia Projects

The activities of the Prairie Farm Rehabilitation administration in the Province of British Columbia during 1959-60 were confined to the completion of construction of one major irrigation project, capital improvement to one existing project, and preliminary investigation of a drainage project.

All engineering services provided by P. F. R. A. in British Columbia during the fiscal year 1959-60, have been undertaken by the Regional engineering Service Division in Regina, Saskatchewan. For the duration of construction of the major irrigation project, one field office was established in Kamloops, B. C. near which the project is located.

Work carried out by P. F. R. A. in British Columbia during 1959-60 in connection with the above mentioned projects, is discussed in the following.

### Mission Flats

Work on the Mission Flats Project involved improvements to an existing pumping plant intake at the Dominion Entomological Station near Kamloops, B. C. The pumping plant is used for irrigation on the station and during 1958-59 problems were encountered with sand and other roughage from the Thompson River entering the well and pumping system.

The following year plans were prepared and a contract was let by P. F. R. A. for a forty foot extension of the project's river intake pipe and for a high level intake structure to be used during flood stages in the river. Also early in 1960 plans and specifications were prepared for the addition of a new well and pump-house for the Dominion Entomological Station.

### B. C. Fruitlands Irrigation District

The B. C. Fruitlands Irrigation District, bordering the Thompson and North Thompson Rivers near Kamloops, B. C., includes some 2,000 acres of irrigable agricultural land as well as some 700 small holdings of one-half acre or less. This area had originally been served by gravity water from Jamieson Creek through a canal and pipe system which had been in operation over forty years and had deteriorated to such an extent that the District could no longer guarantee water to many of its users.

In 1958 an agreement was reached between the District and the Province, and the Province and the Federal Government, for rehabilitation of the District on a cost sharing basis. Part of this agreement provided for the planning and supervision of construction by P. F. R. A. forces.



High level stilling basin and pumping installation built by P.F.R.A. for the B.C. Fruitlands Irrigation district near Kamloops.

Ref. No. 18227



Inside shot of pumping installation for the B.C. Fruitlands Irrigation district.

Ref. No. 18225



The district is divided geographically into three separate areas bordering the North Thompson and Thompson Rivers. Block A, the most northerly of these areas, and the nearest to the gravity supply of Jamieson Creek, continues to receive water through the old system with some minor replacements and improvements. The remainder of the district under rehabilitation will now receive water through two large pumping plants, one on the North Thompson River and one on the Thompson River, which pump both irrigation and domestic water through closed pressure pipe systems to Blocks B and C respectively.

During the fiscal year 1959-60, construction of this project was completed by contract at an approximate total cost of \$700,000.00. An "As-Constructed" report and plans for this project were completed early in 1960 and submitted to the District for their use.

### Surrey-Langley Drainage Project

The Surrey-Langley Drainage Project includes those lands bordering the Nicomekl and Serpentine Rivers near Cloverdale, B.C., which are becoming increasingly subjected to flooding from a combination of suburban development, increased drainage systems from the surrounding high lands, and tidal influence.

During the fiscal year 1959-60, a request was made by the Surrey-Langley Drainage Committee and the Province of British Columbia for P. F. R. A. assistance in preparing a preliminary report on this drainage problem. Investigations are being carried out in hydrology and other phases that will outline the problems involved, the probable chance of success of various methods of improvement to these drainage works, and the cost of any detailed surveys and planning to carry out improvements to the present works. This report is expected to be ready in May of 1960.

## ENGINEERING SERVICES

To provide the basic information required for the sound planning and construction of engineering projects undertaken by P.F.R.A., a number of special divisions have been set up within the Organization under the general heading of Engineering Services.

### Design Division

The main function of the Design Division is the preparation of working drawings and specifications relative to construction of engineering projects that are undertaken by P.F.R.A. For this purpose, close liaison is maintained between the Design Division, field engineers, and other Divisions of the Engineering Services Branch which provide much of the information required in such studies.

During the 1959-60 fiscal year, all work connected with the design and drafting for the South Saskatchewan River Project, was handled by the Design Division. As a result, work on this project represented approximately one-half of the total program carried out by the Division for the year. The balance of time was devoted to preliminary studies and the preparation of final plans and specifications for structures required on the P.F.R.A. and Provincial sections of the Bow River Irrigation Project, the Buffalo Pound Water Supply Project, the Emma Lake Water Conservation Project, and other water development works handled under the regular P.F.R.A. program including the Neepawa Storage Project, the Altawan Dam Project and the Davidson Storage Project.

For advice on the design of the South Saskatchewan River Dam Project, P.F.R.A. obtains the services of prominent consulting engineers. During 1959-60 these included:

Dr. K. Terzaghi,	Cambridge, Mass.	(all aspects)
Prof. A. Casagrande,	Cambridge, Mass.	(all aspects)
Mr. W. Johnson,	Omaha, Neb.	(all aspects)
Dr. L. Straub,	Minneapolis, Minn.	(hydraulics)
Prof. C. D. Smith,	Saskatoon, Sask.	(hydraulics)

Hydraulic model testing again represented an important part of the Design Division's activities for the year. This included Hydraulic model studies of the diversion tunnels and outlet works for the South Saskatchewan River Dam Project conducted at the P.F.R.A. hydraulic laboratory located in Regina, and model testing of part of the spillway for the dam, carried out at the University of Saskatchewan. In addition, hydraulic model studies were continued at the St. Anthony Falls laboratory, Minneapolis, Minnesota, on the inlets for the river diversion tunnel for the South Saskatchewan



River Dam, and on the design of the tunnels as a whole. At this laboratory a start was also made on the general design of the tunnel outlet basin.

### Air Photo Analysis and Engineering Geology Division

Through the use of aerial photographs this Division provides information relative to geology, soil characteristics, topography, drainage and land use required in connection with the planning and design of P.F.R.A. water development and community pasture projects.

Since the Division was officially organized in 1952, the use of aerial photographs as an aid in engineering, agricultural and geological investigations have played an increasingly valuable part in the program of P.F.R.A. In many instances it has made it possible to effect considerable savings in time and money normally involved in field survey and exploration.

To assist in this work the Division maintains a complete library of air photos covering the larger portion of the prairie area. In addition, the Division operates two Balplex machines used for photogrammetric mapping.

Currently the Balplex machines are being employed for the mapping of the South Saskatchewan River Reservoir on the basis of five foot contour intervals. To date 118 half-sectional sheets have been produced on linen by this means, covering approximately 25 miles of reservoir upstream from the main dam. These linens are already in use for purposes of land acquisition.

Air photo reconnaissance studies during the 1959-60 fiscal year have included investigations in regard to location, geology, soils vegetation, grazing, water facilities, clearing of land, establishing management zones, fencing and access for two new proposed community pasture projects and the Arena Community Pasture, as well as location surveys for six new water development schemes. In addition, granular material searches were carried out in five general areas - Avonlea Creek, Esterhazy, Oungre, Whitesand and Wood River. Approximately ninety townships, or 3,420 square miles were examined in these areas and a total of 160 deposits were mapped.

In the field of engineering geology, foundation studies were carried out on 9 proposed damsites including the Qu'Appelle Valley Dam, South Saskatchewan River Project, the Waterton Dam, and the St. Mary Irrigation Project as well as four proposed damsites in the headwaters of the Assiniboine River and three further downstream associated with the Russell Project. Investigations were also carried out in connection with some dredging planned along a section of the Icelandic River in Manitoba where there were indications that limestone bedrock lay close to the surface in the river channel.

## Hydrology Division

This Division was established for the purpose of providing basic hydrologic information for the planning, design and operation of P. F. R. A. projects. In addition, the Hydrology Division acts as the Secretariat for the Prairie Provinces Water Board for which it undertakes special studies. It also provides information for the Canadian section of certain International Engineering Boards established under the International Joint Commission.

### Individual Project Studies.

Studies were carried out to evaluate flood potential or water supply or both, for a total of 42 projects in 1959.

To determine water supply, investigations generally require the reconstruction of flow records on the watershed being considered; an estimate of past, present and future water demands for the basin; and a study of storage requirements necessary to supply these demands. In many cases, projects are located in areas where there are no streamflow records. This necessitates the preliminary step of studying the relationship between rainfall and runoff for the area being studied. The results of reservoir studies are usually presented in the form of storage-draft curves which can be used by design engineers to establish the storage required to meet a variety of anticipated water demands.

Flood potential investigations for small projects are usually restricted to estimates of average daily flood peaks with a probable recurrence interval of 50 years or less.

### Watershed Studies

Four watershed studies were completed during 1959. These were as follows:

1. Hydrology of Bear Creek Watershed near Kelowna, B. C. February 1959.
2. Water Supply and Flood Control Aspects of the Upper Assiniboine River Storage Investigations - prepared jointly with the Winnipeg Regional Office.
3. Water Supply and Flood Potential of the Willow Creek Drainage Basin. July 1959.
4. Water Supply and Use on Antler, Gainsborough and Lightning Creeks. Hydrology Report #28, November 1959.

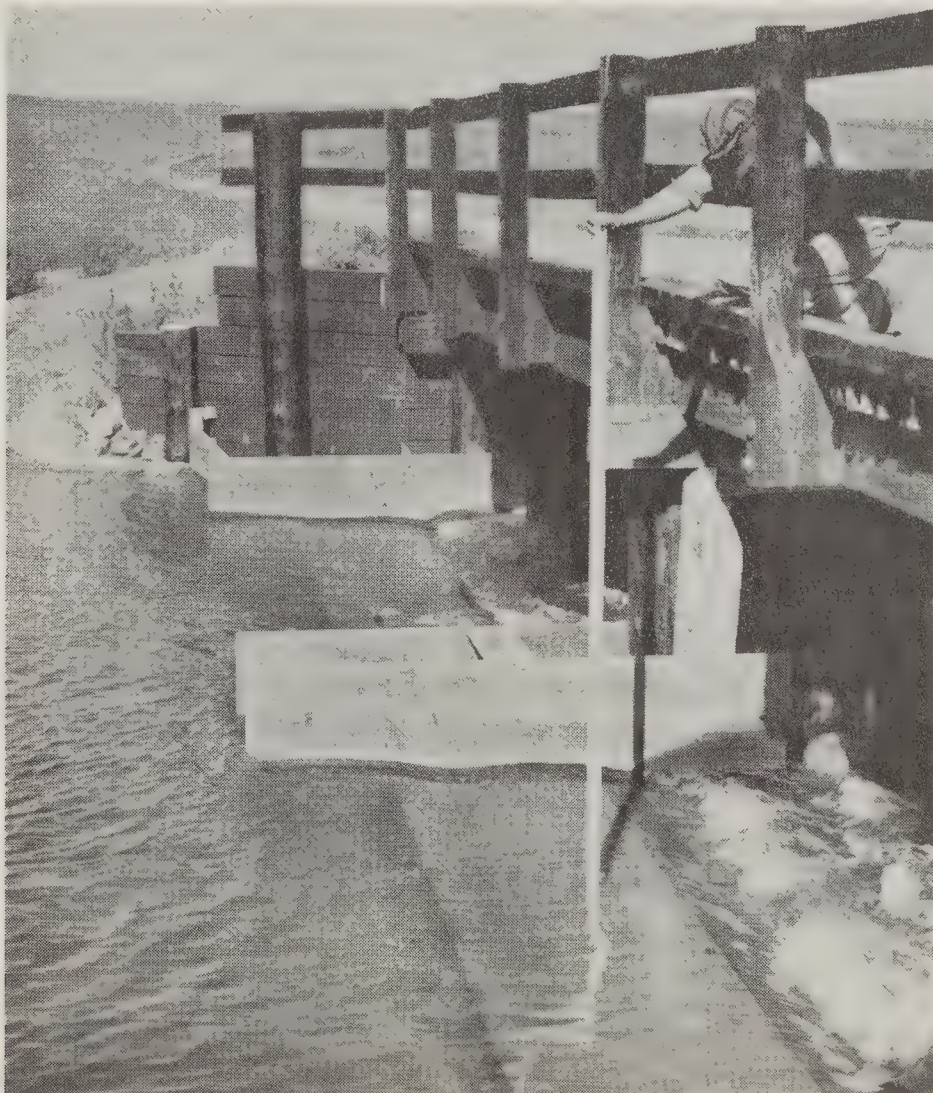


In addition to the above, the Prairie Provinces Water Board has instructed the Secretariat to prepare a preliminary report outlining the cost and scope of a study which would lead to the development of an integrated plan of development for the Saskatchewan River Basin. The preliminary report is to be completed in June of 1960.

### Special Investigations

Flow records for all streams on the prairies are being studied and ultimately a report will be produced outlining the magnitude and frequency of runoff on the prairies. This report is being prepared for the Prairie Provinces Water Board. A paper entitled "The Magnitude and Frequency of Floods on the Canadian Prairies" presented by representatives of the Hydrology Division to the First Canadian Symposium on Hydrology in November 1959, defined the flood potential of streams in southern Manitoba and Saskatchewan. Work is continuing to complete a similar report for the Alberta streams rising on the eastern slopes of the Rocky Mountains.

Great rainstorms which have occurred on the prairies are being studied in order to determine the largest floods likely to occur, and the response of rivers to heavy rainfall. The results of these analyses may be used to determine flood potential more accurately at any given point on the prairies for design purposes.



Testing flow in water supply canal extending from the South Saskatchewan River to Buffalo Pound Lake, Buffalo Pound water supply project.



At the South Saskatchewan River damsite on the South Saskatchewan River, the Hydrology Division established an automatic water level recording station and 5 supplementary step gauges. Information from these gauges is being used to forecast water levels in the construction area. Other information, such as tailwater curves for the spillway, will also be developed from these records.

Observation points for water flow and water quality were also established along the upper Qu'Appelle River in 1959. The purpose of these gauges was to pinpoint conveyance losses which were occurring between Elbow and Buffalo Pound Lake. Since most of the flow in the Qu'Appelle River was pumped water from the South Saskatchewan River at Elbow, the amount and distribution of these losses and the change in water quality, is very important.

### Soil Mechanics and Materials Division

The Soil Mechanics and Materials Division is required to provide technical advice on the design of dams, excavations and structure foundations. The Division is responsible for the testing of soils, cement, concrete aggregate, and other materials used for construction purposes.

To carry on these functions the Division makes detailed investigations of damsites and foundations, usually with P.F.R.A. equipment; conducts laboratory tests, analysis data, and makes the appropriate design studies. For projects under construction, control testing of soils, cement and concrete required, special test apparatus is often installed to measure the performance of dams, spillways and conduits.

Generally a report is prepared for every project investigated or special study made. Twenty-three of these reports were completed in 1959. This involved the preparation of approximately 400 engineer drawings, a little over 100 of which were in connection with the South Saskatchewan River Project, 34 the St. Mary Irrigation Project, and the remaining 250 miscellaneous smaller projects.

Other activities included an extensive research program to determine the best type of sulphate resistant cement to be used in concrete with special reference to the South Saskatchewan River Project where there exists high sulphate concentrations in the bedrock shale. The findings of this laboratory program are being verified by observation on concrete specimens, made with aggregate from the site and various cements which have been buried in shale at the site for up to eight years in an area known as the "cement farm".

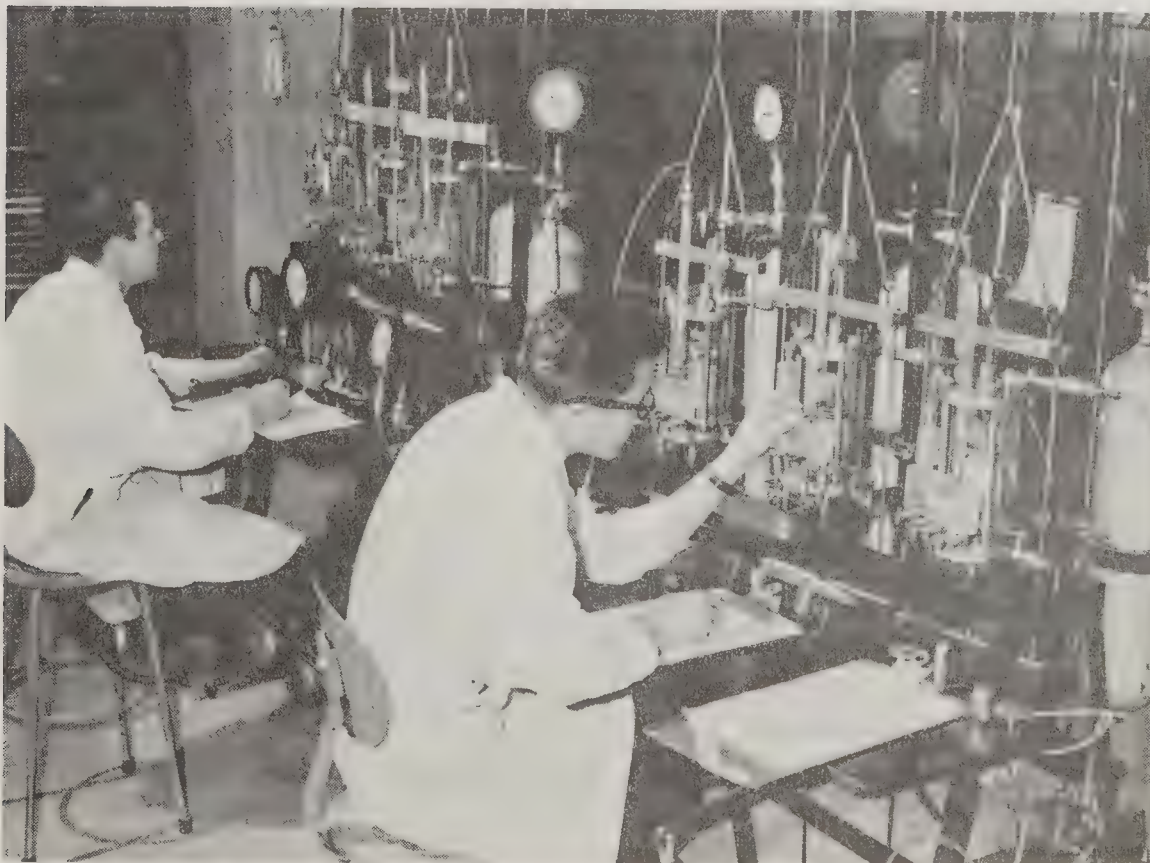
The Drilling Department during 1959-60 worked at a total of 26 sites on 17 different projects. Over 21,500 samples were recovered from these sites and about 60,000 lineal feet of test holes were drilled. Slightly over one half the drilling and sampling was undertaken on the South Saskatchewan River





Processing heavy materials used for concrete aggregate in Soil Mechanics' laboratory aggregate testing room.

Ref. No. 21733



Technician at the Soil Mechanics' laboratory, Saskatoon operating equipment used for the determining of shear strength in soils used for construction purposes.

Ref. No. 21725

Project. An experimental program of air drilling was carried out to develop a method of drilling dry holes in the Bearpaw shale in this area.

The 1959-60 fiscal year also saw the completion of the new Soil Mechanics and Materials Building on the University Campus in Saskatoon. The office and laboratory staff and all equipment have now been moved into the new quarters. The building has been specifically designed for the type of laboratory work being carried out - e. g. it has special "fog" and "humid" rooms for the storage of concrete and soil samples, and temperature controlled cement and soil testing rooms.

### Drainage Division

The Drainage Division of the P. F. R. A. was organized in 1949 to investigate and make recommendations for reclamation of areas that have become salinized under irrigation due to inadequate drainage. Many of these problems are complex because of the extreme variability in soil and topographic conditions.

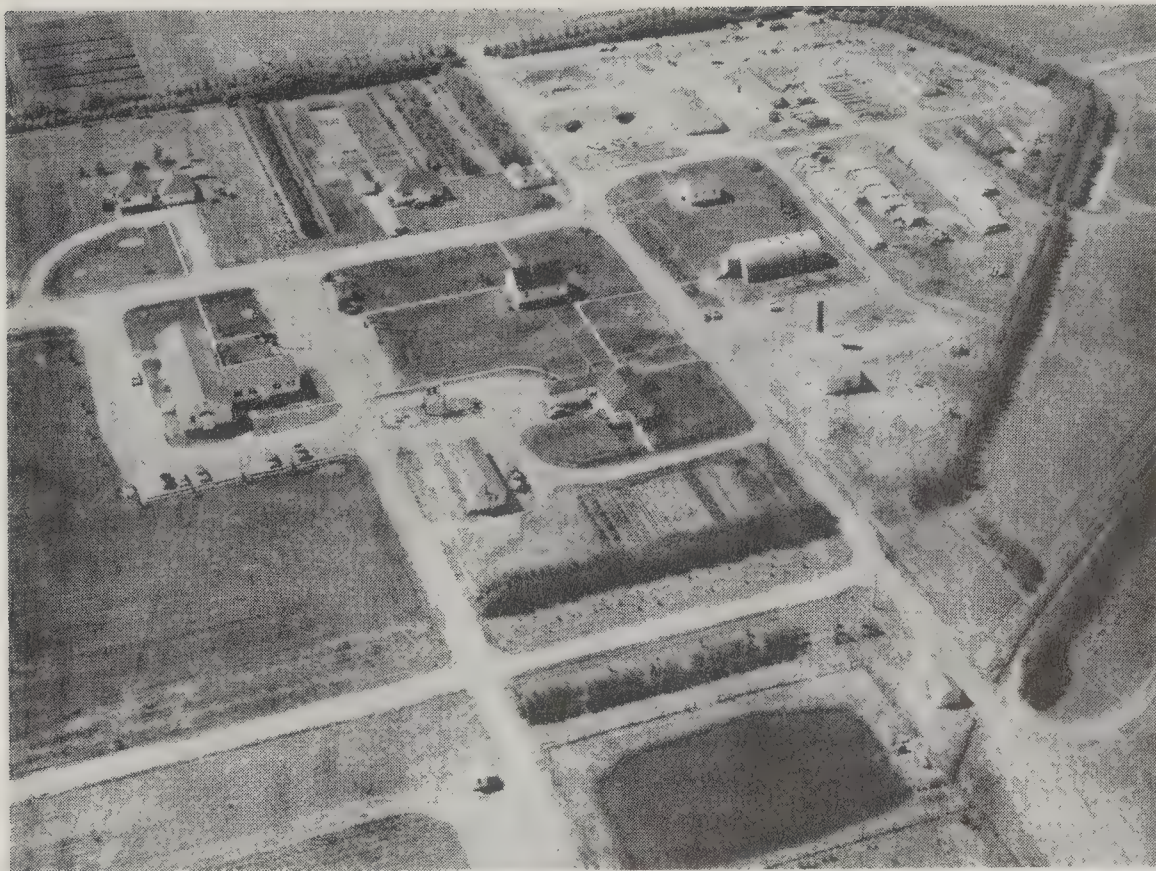
Proper land preparation is considered to have basic importance in minimizing drainage problems. For this reason the Division has given technical assistance in land levelling to P. F. R. A. and other projects.

Many of the presently irrigated lands, however, are located on fine textured alluvial soils or on glacial till and present inherent drainage problems. Much information has been obtained by the Drainage Division in recent years, relative to the performance of various soils under irrigation. This is now being used to evaluate the suitability of the soils of proposed irrigation projects as in the case of the South Saskatchewan River Project. Standards developed are used in the economic and physical land classification of irrigation projects in Alberta and Saskatchewan. Drainage trials presently under way are yielding useful information relative to the feasibility of subsurface drainage of glacial till soils which not only have application in areas immediately under investigation, but a transferable value to other areas that have similar soil conditions.

On the Bow River Irrigation Project groundwater observations, tile drainage investigations, irrigation efficiency studies and land levelling surveys were continued during 1959 involving both field operations and laboratory analysis. In addition, the Division continued to give assistance on a joint committee appointed to make a land classification of the Bow River Project, the final report on which is expected to be published early in 1960.

Contained in the land classification report is a summary of the Drainage Division's findings pertaining to soil suitability for irrigation on the Bow River Irrigation Project as shown by salinization trends. Also included is a summary of groundwater studies, topography, and detailed physical and chemical characteristics of the soils studied.





Aerial view of Drainage Division headquarters and laboratory Vauxhall, Alberta.

Ref. No. 18010

Relating to this is the land classification work currently being undertaken on the South Saskatchewan River Project where the information obtained from the Bow River investigations is being used as a basis for the study. At the request of the Saskatchewan Department of Agriculture, the Division has provided its services in carrying out a large scale land classification survey of the area proposed for irrigation. One sterling drill crew with a soil and drainage specialist in charge, carried out soil sampling and characterization during the summer and fall of 1959. About 1,200 deep holes were drilled and some 8,000 soil samples taken in connection with this study. From the information gathered and past experience on the Bow River Project, standards of soil and topography are being set up suitable for the South Saskatchewan River Irrigation Project.

Other activities of the Drainage Division in 1959 included work in the Rush Lake area of the Swift Current Irrigation Project. This involved the evaluation of spring flood and normal methods of irrigation employed in this area, and investigations concerning high water table and salinity conditions which have proven to be a problem in certain sections of the project.

Pumping tests to reduce high water table and salinity problems in the Upper and Lower V districts of the Maple Creek Irrigation Project were also continued during the year. Results from these tests indicate that water table levels can be maintained at a safe elevation for crop production by a continuous pumping program, provided external influences can be reduced to a reasonable minimum.

In all instances samples taken by the Drainage Division in connection with its work both in Alberta and Saskatchewan, have been processed in the Drainage Laboratory at Vauxhall. During 1959, this involved the handling of approximately 14,000 soil and water samples representing over 42,000 separate laboratory determinations.



## CONSTRUCTION, EQUIPMENT and SUPPLY DIVISION

This division is intended to service the diversified activities of the other branches of P. F. R. A. and maintain facilities for construction and repair of works and equipment. The division employs over 80 full time staff of whom about 40 % are tradesmen in the central shops, 25 % are primarily engaged in field construction, and the remaining 35 % are about equally divided between plant maintenance, stores and inventory, administration and special services. Seasonal employees are required for field construction and maintenance work in varying numbers according to the volume and type of work to be done.

The main equipment depot and shop facilities are located in Moose Jaw. The carpenter shop is well equipped to do fine woodwork, build water troughs for community pastures, trailers for camp accommodation or forms for concrete work. The vehicle repair shop carried out repairs on 105 vehicles last year, many being major repair jobs. The general repair and machine shop recorded 240 different jobs, many of which were extensive overhaul jobs on tractors and construction equipment. These shops also contributed to the construction of approximately \$80,000 of new equipment including camp trailers and special equipment required by this and other divisions.

The plant maintenance staff is responsible for the operation, maintenance and security of the buildings and grounds. Members of this group also undertook 18 field jobs installing heating and plumbing in community pasture and project houses. This has become necessary because of the remote location of many of these buildings. Local contractors are not prepared to undertake these jobs at the expense of more lucrative work closer to their bases of operation. For similar reasons it has become necessary to provide some service for camp equipment used by P. F. R. A. crews throughout the area.

The basic field construction staff comprises competent construction supervisors and foremen as well as technicians and craftsmen. This staff is equipped to undertake jobs which are not ordinarily done by local contractors. Emphasis is placed on providing experienced personnel and special equipment which may be supplemented by local labour and equipment that is available. During 1959 this section worked on 73 different jobs involving a direct expenditure of about \$150,000. The jobs included timber work, repairs to concrete and steel water control structures, dredging, pipe laying, tunnelling, pile driving, land levelling, brush spraying, fireguarding and land development. This variety of field work requires many different types of equipment as well as good organization and supervision. Work crews are organized and equipped to provide as much flexibility as possible without sacrificing efficiency or the quality of the work done. A system of work orders is used for both field and shop operations which enables cost records being obtained for each job and for separate items, if such is required.

The division is responsible for purchasing procedures including vehicles, machinery, materials and repair parts. Tenders are invited from local suppliers wherever possible and are received on the basis of appropriate specifications prepared by this division according to the requirements of the equipment or material. Some classes of material are obtained for specific jobs while a supply of standard materials are retained in a revolving fund stores from which issues are charged to projects on withdrawal. The revolving fund stores serves most of P. F. R. A. from Moose Jaw, while a portion of it is allotted to the Bow River Project in Alberta.

The purchase of equipment requires that it be recorded on an inventory. A procedure is followed whereby all equipment is reported to the departmental inventory and simultaneously recorded on an operational inventory. The latter has been a necessity for some time but a major revision of the system was undertaken this year to better accommodate the nearly 6,000 items of equipment and to fit in with the departmental inventory. The present system provides a complete list of equipment of each type and a cross reference indicating present location. A similar operational record is maintained for items of engineering and office equipment and 361 vehicles.

The area served by P. F. R. A. requires movement of materials and equipment over considerable distances. A variety of truck and tractor-trailer combinations travelled over 130,000 miles last year on 544 trips transporting an estimated 3,280 tons of equipment and materials. Local commercial transport is used for some operations but it is frequently not available for the type of hauling or at the time required.

A fire prevention and safety program is carried on throughout the whole organization by an experienced and qualified supervisor. The program includes an annual inspection of all community pasture headquarters buildings and other premises occupied by P. F. R. A. personnel. Construction crew field camps are inspected regularly. Reports are submitted on each inspection and fire hazards or safety requirements are referred to the officers in charge for attention. The limited number of on-the-job accidents and no fire losses during the year indicate satisfactory results from this program.

The division has undertaken work or services for all divisions of P. F. R. A. during the year either by direct participation or providing supervision of commercial services that may be available.



## PLANNING and INFORMATION DIVISION

The Planning and Information Division was established in 1949 to provide information, library and photographic services to all branches and divisions of P.F.R.A. The principal duty of the Division is to collect and assemble information pertaining to the history and development of P.F.R.A. for use in the preparation of reports, publications, articles and other material required for public distribution. Included in this work is the preparation of the P.F.R.A. Annual Report; reports on P.F.R.A. activities used in the Annual Report of the Minister of Agriculture and the Canada Year Book; reports on activities for the Deputy Minister of Agriculture, and progress and summary project reports. It is also becoming increasingly involved in news work for the organization - preparing appropriate material on P.F.R.A. activities for press, radio and TV, particularly with respect to the South Saskatchewan River Project.

A further important activity of the Division is to be responsible for arranging the itinerary and program of visitors to P.F.R.A., and handling requests for information on P.F.R.A. activities received from schools and other outside institutions, agencies and organizations. During the year several visitors, including nine Colombo Plan Students, were handled by the Division.



P.F.R.A. display used during Swift Current Exhibition, 1960 as part of publicity program carried out by the Planning and Information Division during the year.



Nearing the close of 1959-60, the Division's terms of reference were extended to include responsibility for publicity and public relations activities required by the organization with particular reference to the South Saskatchewan River Project. This involved the independent handling of news coverage required by press, radio and TV on a local level, and supplying all material required by the Information Division in Ottawa for release nationally. This represented a major departure from procedure previously followed by the Federal Department of Agriculture wherein both local and national coverage has always been handled direct from Ottawa. It is expected that these increased duties will add considerably to the work of the Division in the forthcoming year.

### Library

Activities of the P. F. R. A. Library in Regina include the ordering and distribution of books, periodicals, information publications and government documents held by P. F. R. A. either in the Library in Regina or in other offices; and the filing and cataloguing of pamphlets, bulletins, reports and books in accordance with standard library procedure.

During the 1959-60 fiscal year a total of 1,077 publications were processed through the Library, 794 of which were purchased, 163 were obtained free of charge, and 120 obtained on a loan basis. In addition, the P. F. R. A. Library handled the regular circulation of approximately 220 periodicals to interested staff members in Regina and field offices.

### Photo Section

The Photo Section of the Planning and Information Division provides services to all divisions and branches of P. F. R. A. and also to other Federal Government Departments in the area as required. In addition, it assumes responsibility for the care of all photographic equipment in P. F. R. A. and maintains a complete file of all P. F. R. A. black and white prints, negatives and color slides taken by the organization.

In essence this involves three major fields of work. The first concerns maintaining a complete photographic record of P. F. R. A. activities for documentary purposes. The second includes the taking and processing of pictures for publicity and public relations purposes such as illustrating reports, information bulletins and articles, etc, as well as for display purposes and to illustrate talks. The photographic reproduction of engineering drawings, plans and aerial mosaics, comprises the third service generally representing a considerable portion of the total work of the section. Another activity receiving increasing attention is the production of movies for technical, TV and general distribution purposes. It is anticipated that the production of short 3-5 minute movies in black and white for TV purposes will become a more important feature of the activities of this section in the coming year.



The quantity of work produced during 1959 continued to increase over previous years due principally to a heavy demand for documentary and publicity pictures on the South Saskatchewan River Project. In total 1,230 requests were received by the section for various types of work during the year. Included in this was the developing of 420 rolls of film, the printing of 9,538 contact pictures and production of 46,511 photographic enlargements of pictures ranging in size from 4" x 5" to 40" x 60", and the copying of 1,389 mosaics, plans and charts. About 3,000 prints and color negatives were added to the print and slide files in Regina. Also during 1959-60, approximately 7,700 feet of color and black and white movie film was shot and catalogued.

# APPENDIX I

## WATER DEVELOPMENT PROGRAM

Progress by Years in the Construction of Individual, Neighbor and Community Projects

Number of Projects Constructed					Financial Assistance Paid			
Fiscal Yr.	DO	SWD	IRR	TOTAL	DO	SWD	IRR	TOTAL
*1935-46	23,158	4,573	1,032	28,763	2,469,106.61	496,711.09	173,557.12	3,139,374.82
1946-47	4,945	199	448	5,192	581,172.05	48,341.75	8,697.82	638,211.62
1947-48	1,804	241	64	2,109	202,443.78	140,601.81	90,715.57	433,761.16
1948-49	1,508	220	77	1,805	171,566.42	319,540.09	365,241.68	856,348.19
1949-50	3,031	164	123	3,318	367,392.80	214,973.66	220,242.50	802,608.96
1950-51	3,442	494	721	4,657	408,385.52	295,594.47	237,892.22	941,872.21
1951-52	478	106	350	934	60,051.14	95,488.30	171,773.19	327,312.63
1952-53	861	119	290	1,270	100,219.54	32,769.41	116,672.07	249,661.02
1953-54	1,791	190	187	2,168	227,372.12	126,415.05	209,287.59	563,074.76
1954-55	1,314	242	193	1,749	161,716.42	201,457.82	122,534.03	485,708.27
1955-56	504	159	114	777	68,141.55	78,443.87	87,547.88	234,133.30
1956-57	863	131	114	1,108	112,268.86	46,272.04	157,803.10	316,344.00
1957-58	2,218	225	155	2,598	268,273.35	143,319.23	90,787.91	502,380.49
1958-59	3,288	281	168	3,737	411,791.24	135,211.03	97,049.58	644,051.85
1959-60	3,974	259	136	4,369	820,479.90	98,981.43	70,894.59	990,355.92
TOTAL	53,179	7,603	3,772	64,554	6,430,381.30	2,474,121.05	2,220,696.85	11,125,199.20

DO — Dugout

SWD — Stockwatering Dam

IRR — Individual Irrigation Project

\* — Annual figures for accumulated years may be found in previous reports



## WATER DEVELOPMENT PROGRAM

Number of Individual, Neighbor, Community and Large Water Development Projects and amount of financial assistance paid from April 1, 1959 to March 31, 1960

DUGOUTS				DAMS				IRRIGATION PROJECTS				TOTALS			
Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid
<u>MANITOBA</u>															
550	102,819.79	8	1,740.84	10	4,965.70	568	109,526.33								
3	1,161.46	1	812.71	-	-	4	1,974.17								
-	-	-	-	-	-	-	-								
-	-	1	89,644.00	-	-	1	89,644.00								
553	103,981.25	10	92,197.55	10	4,965.70	573	201,144.50								
<u>Total</u>															
<u>SASKATCHEWAN</u>															
2,441	470,858.95	98	12,782.02	93	35,167.45	2,632	518,808.42								
30	11,272.08	-	-	5	3,966.69	35	15,238.77								
22	33,027.86	6	25,437.62	1	14,255.54	29	72,721.02								
-	-	1	36,006.00	-	-	1	36,006.00								
2,493	515,158.89	105	74,225.64	99	53,389.68	2,697	642,774.21								
<u>Total</u>															
<u>ALBERTA</u>															
914	170,525.48	142	18,028.02	24	9,100.58	1,080	197,654.08								
4	986.23	-	-	2	801.84	6	1,788.07								
10	29,828.05	4	40,180.22	1	2,636.79	15	72,645.06								
-	-	-	-	-	-	-	-								
928	201,339.76	146	58,208.24	27	12,539.21	1,101	272,087.21								
<u>Total</u>															
3,974	820,479.90	261	224,631.43	136	70,894.59	4,371	1,116,005.92								
<u>GRAND TOTAL</u>															

APPENDIX III

WATER DEVELOPMENT PROGRAM

Number of Individual, Neighbor, Community and Large Water Development Projects and amount of financial assistance paid from April 1, 1935 to March 31, 1960

	DUGOUTS				DAMS				IRRIGATION PROJECTS				TOTALS	
	Projects Paid		Financial Assistance Paid		Projects Paid		Financial Assistance Paid		Projects Paid		Financial Assistance Paid		Projects Paid	
	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid
MANITOBA														
Individual	11,984	1,249,796.88	322	25,200.22	177	54,317.04	12,483	1,329,314.14						
Neighbor	59	12,309.30	15	4,496.20	8	2,212.62	82	19,018.12						
Community	6	11,030.86	23	128,169.72	2	30,582.54	31	169,783.12						
Large Water	-	-	18	1,055,965.00	6	617,217.00	24	1,673,182.00						
Total	12,049	1,273,137.04	378	1,213,831.14	193	704,329.20	12,620	3,191,297.38						
SASKATCHEWAN														
Individual	33,956	3,992,793.70	4,457	388,709.27	2,292	536,283.23	40,705	4,917,786.20						
Neighbor	309	81,512.40	54	11,690.94	99	43,080.09	462	136,283.43						
Community	304	250,110.20	180	959,121.46	65	633,540.08	549	1,842,771.74						
Large Water	-	-	34	2,956,399.00	35	4,079,910.00	69	7,036,309.00						
Total	34,569	4,324,416.30	4,725	4,315,920.67	2,491	5,292,813.40	41,785	13,933,150.37						
ALBERTA														
Individual	6,477	749,253.94	2,431	236,149.10	1,061	255,186.54	9,969	1,240,589.58						
Neighbor	41	11,787.11	13	3,318.10	15	5,033.69	69	20,138.90						
Community	43	71,786.91	108	717,266.04	53	660,461.02	204	1,449,513.97						
Large Water	-	-	4	26,632.00	18	693,004.00	22	716,636.00						
Total	6,561	832,827.96	2,556	980,365.24	1,147	1,613,685.25	10,264	3,426,878.45						
GRAND TOTAL	53,179	6,430,381.30	7,659	6,510,117.05	3,831	7,610,827.20	64,669	20,551,326.20						



APPENDIX IV  
COMMUNITY WATER STORAGE AND IRRIGATION PROJECTS  
To March 31, 1960

(Community Projects costing less than \$1,000.00 are grouped under the heading of Small Community Projects in Appendices II and III)

MANITOBA

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Alexander Soil Conservation	Alexander	Soil Conservation	1944	-	-	5,250.00
Birtle Dam	Birtle	Stockwatering Dam	1947	-	-	11,490.00
Boissevain	Boissevain	Storage Dam	1954	-	580	29,992.00
Brandon Flood Irrigation	Brandon	Flood Irrigation	1949	1,000	-	27,107.00
Brandon Water Supply	Brandon	Storage Dam	1940	-	500	3,996.00
Clearwater Storage	Clearwater	Stockwatering Dam	1938	-	12	5,949.00
Crystal City Storage	Crystal City	Stockwatering Dam	1935	-	3	3,334.00
Dead Lake Community	Gladstone	Irrigation	1950	20	90	1,933.00
Edwards, R.M. of	Melita	Stockwatering Dam	1935	-	100	10,214.00
Hague Dam	Sanford	Stockwatering Dam	1953	-	-	29,183.00
Hampson Dam	Sanford	Storage Dam	1954	-	420	16,899.00
Hartney	Hartney	Irrigation	1941	-	-	10,264.00
Killarney	Killarney	Multi-purpose Dam	1956	-	800	41,965.00
LaSalle River Dams	LaSalle	Stockwatering Dam	1941	-	900	22,989.00
Lewko Dam	Sanford	Storage Dam	1954	-	320	20,874.00
Little Souris River Dam	Melita	Stockwatering Dam	1945	-	250	1,380.00
Mary Jane Storage Project	Manitou	Multi-purpose Dam	1959	-	1,150	89,644.00
McAuley Community Dam	McAuley	Stockwatering Dam	1955	-	20	2,051.00
Melita	Melita	Irrigation	1941	3,900	3,200	11,372.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Minnedosa Dam	Minnedosa	Storage Dam	1950	20	1,500	105,051.00
Morden Dam (Dead Horse Creek)	Morden	Irrigation	1941	100	1,200	344,274.00
Morris River-Rock Lake	Carmen	Stockwatering Dam	1940	—	10,000	23,401.00
Napinka	Napinka	Irrigation	1941	—	—	6,770.00
Neepawa Storage Project	Neepawa	Multi-purpose Dam	Incomplete	—	3,800	299,725.00
Oak Lake	Oak Lake	Irrigation	1956	13,000	—	119,205.00
Park Lake	Neepawa	Stockwatering	1953	—	—	21,626.00
Plum Coulee	Plum Coulee	Multi-purpose Res.	1957	—	12	5,939.00
Rivers Dam	Rivers	Multi-purpose Res.	Incomplete	—	—	967,411.00
Roland	Roland	Stockwatering Dugout	1957	—	1.5	1,000.00
Rosebank Dam	Rosebank	Stockwatering	1948	—	32	12,161.00
Roseau River Dam	Dominion City	Multi-purpose Dam	1957	—	—	54,705.00
Shoal Lake Project	Shoal Lake	Stockwatering	1948	—	3,500	8,491.00
Souris Dam	Souris	Multi-purpose Dam	1952	—	150	73,597.00
Souris, Town of	Souris	Stockwatering Dam	1935	—	150	3,841.00
St. Malo Dam	St. Malo	Multi-purpose Dam	1958	—	1,770	266,937.00
St. Lazare Storage Reservoir	Lazare	Stockwatering	1948	—	5	1,470.00
Turtle Mountain Reservoir	Boissevain	Multi-purpose Res.	1956	70	600	11,968.00
Wawanesa	Wawanesa	Irrigation	1941	—	—	125,332.00
Westbourne, R.M. of	Gladstone	Stockwatering	1947	—	—	5,993.00
Whitemud River	Woodside	Stockwatering	1949	—	160	6,506.00
Whitemud River Storage	Gladstone	Stockwatering Dam	1943	—	660	11,464.00
SASKATCHEWAN						
Abbey	Abbey	Stockwatering Dugout	1958	—	1.5	1,000.00
Adair Creek	Wolseley	Multi-purpose Dam	1956	40	350	59,849.00
Adam's Lake	Battle Creek	Irrigation	1936	1,500	2,000	8,831.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Admiral Storage Dam	Admiral	Irr. & Stockwatering	1949	2,000	2,200	38,520.00
Allan	Allan	Stockwatering	1948	-	300	4,477.00
Altawan	Govenlock	Irrigation	Incomplete	-	5,830	148,461.00
Alsask	Alsask	Multi-purpose Res.	1958	-	30	9,710.00
Arcola	Arcola	Stockwatering Dam	1939	-	(underground)	17,310.00
Arena	Arena	Irr. & Stockwatering	1949	1,600	3,200	5,218.00
Arrarat	Abbey	Stockwatering Dam	1959	-	6	7,398.00
Artland Grazing	Marsden	Dugout	1955	-	1.5	1,000.00
Avon Heights Grazing Co-op.	Shaunavon	Stockwatering	1955	-	60	2,428.00
Avonhurst	Qu'Appelle	Stockwatering	1956	-	1.5	3,200.00
Avonlea	Avonlea	Dugout	1959	-	3	2,170.00
Balcarres	Balcarres	Stockwatering	1948	-	100	7,203.00
Balcarres Storage	Balcarres	Stockwatering	1953	-	20	10,294.00
Bateman	Gravelbourg	Irr. & Stockwatering	1949	400	114	4,739.00
Battleford	N. Battleford	Irrigation (pump)	1941	800	-	3,058.00
Beadle	Eston	Dugout	1959	-	3	1,393.00
Beaver Creek	Hanley	Stockwatering	1951	-	200	7,998.00
Beechy #1	Beechy	Irr. & Stockwatering	1946	600	1,000	12,746.00
Beechy #2	Beechy	Irr. & Stockwatering	1948	200	100	6,240.00
Beechy Co-op.	Beechy	Stockwatering Dugout	1957	-	1.5	1,000.00
Belvoir	Glamis	Dugout	1959	-	3	1,484.00
Bengough	Bengough	Stockwatering Dugout	1957	-	1.5	1,000.00
Big Arm Storage	Liberty	Irrigation	1939	5,000	5,200	13,161.00
Black Hills Grazing Co-op.	Piapot	Dugout	1955	-	5	2,520.00
Boharm	Boharm	Stockwatering	1948	-	100	6,250.00
Bracken	Bracken	Stockwatering	1946	-	158	1,001.00
Braddock Dam	Braddock	Irrigation	1952	2,000	1,600	83,999.00
Bright Water Creek	Hanley	Irrigation	1956	2,500	3,500	11,713.00
Brown Hill Dam	Grenfell	Multi-purpose Dam	1958	-	275	99,394.00
Buffalo Pound	Qu'Appelle Valley	Irrigation	1940	x	-	83,723.00
Cabri	Cabri	Stockwatering	1948	-	340	37,553.00
Cadillac	Cadillac	Irrigation	1945	800	1,350	32,887.00
Camberly	Camberly	Irrigation & Dam	1950	-	100	2,106.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs	
Canora	Canora	Storage Dam	1941	-	300	16,128.00	
Caron	Caron	Storage	1948	-	100	17,109.00	
Caron Water Development	Thunder Creek	Storage Dam	1944	-	43,500	710,433.00	
Cedoux	Cedoux	Stockwatering	1947	-	314	4,999.00	
Ceylon Reservoir	Ceylon	Irrigation & Dam	1952	300	250	8,087.00	
Chapleau Lake	Montmartre	Stockwatering	1949	-	3,530	8,208.00	
Clair Creek	Wadena	Flood Irrigation	1957	100	-	1,877.00	
Claydon	Claydon	Multi-purpose Res.	1957	-	30	2,498.00	
Claydon	Claydon	Irrigation	1959	700	300	7,015.00	
Clearfield	Goodwater	Irrigation & Dam	1951	70	300	5,999.00	
Colgate	Colgate	Flood Irrigation	1958	320	-	7,110.00	
Conquest, Village of	Conquest	Dugout	1954	-	1.5	1,000.00	
Congress-Stonehenge	Limerick	Stockwatering Dugout	1958	-	2	1,000.00	
Consul-Vidora	Vidora	Irrigation	1950	3,000	-	62,500.00	
Coronach	Coronach	Irrigation & Dam	1947	300	1,450	97,807.00	
Craven Dam	Qu'Appelle Valley	Irrigation	1943	x	-	33,675.00	
Crooked & Round Lake	Qu'Appelle Valley	Irrigation	1941	x	-	48,650.00	
Cypress Storage	Ravenscrag	Irrigation	1939	20,000	80,000	467,691.00	
Coleville, Village of	Coleville	Dugout	1958	-	1.5	1,000.00	
Dalmeny	Dalmeny	Stockwatering	1951	-	3	1,000.00	
Davidson	Davidson	Irrigation	1937	100	277	3,114.00	
Davidson Storage Project	Davidson	Multi-purpose Dam	1959	-	400	36,006.00	
Davin	Kronau	Stockwatering	1947	-	1,080	13,501.00	
Dead Lake	Macoun	Irrigation	1941	Souris River Development			17,528.00
Delisle	Delisle	Stockwatering	1950	-	45	4,899.00	
Dixon Lake	Spring Valley	Irrigation	1959	500	2,500	13,951.00	
Doonside Dam	Wawota	Irrigation	1955	1,500	1,500	3,438.00	
Downey Lake	Maple Creek	Stockwatering Dam	1958	-	58	1,404.00	
Dry Coulee	Eastend	Stockwatering Dam	1958	-	10	1,605.00	
Dry Lake	Forward	Stockwatering	1949	-	600	9,729.00	
Dunn & Watt	Mankota	Irrigation	1937	305	-	2,996.00	
Dunning	Radville	Irrigation	1951	120	200	3,566.00	
Dummer	Milestone	Irrigation & Dam	1949	500	200	4,742.00	
Doddsland	Druid	Dugout	1958	-	1.5	1,000.00	



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Eagle Hill Creek	Plenty	Stockwatering	1946	-	10,700	6,432.00
Eagle Lake	Coleville	Irrigation & Dam	1949	2,000	3,000	5,998.00
Eastend	Eastend	Irrigation	1939	4,000	1,300	161,682.00
Eastview	Eastview	Stockwatering	1949	-	200	5,970.00
Eatonia	Eatonia	Stockwatering	1949	-	12	1,199.00
Echo Lake	Qu'Appelle Valley	Irrigation	1943	x	-	41,753.00
Egg Lake	Avonhurst	Multi-purpose Res.	1957	800	-	10,047.00
Elfros	Elfros	Stockwatering	1949	-	25	7,330.00
Emerald Hill	Milestone	Stockwatering	1958	-	250	7,582.00
Eston	Eston	Stockwatering	1954	-	10	11,469.00
Fahlman's Creek Project	Balgonie	Stockwatering	1949	-	400	15,599.00
Fairy Hill	Qu'Appelle Valley	Irrigation	1941	x	-	4,302.00
Fife Lake Restoration	Constance	Irrigation & Dam	1954	1,200	-	9,596.00
Fife Lake #2	Constance	Irrigation & Dam	1954	650	-	6,348.00
Fillmore	Fillmore	Stockwatering Dugout	1958	-	1.5	1,000.00
Fleming	Moosomin	Stockwatering	1950	-	75	3,282.00
Foam Lake (Elfros)	Foam Lake	Irrigation	1957	4,000	-	11,964.00
Francis Lake	Morse	Irrigation	1956	1,560	-	17,305.00
Frenchman Flats	Dundurn	Irrigation	1949	1,800	2,800	9,996.00
Frenchville	Frenchville	Irrigation & Dam	1947	430	670	8,096.00
Gibson Flats	Pennant	Irrigation	1953	1,200	-	14,177.00
Girvin	Girvin	Stockwatering Dam	1937	-	19	2,180.00
Glenside	Glenside	Stockwatering	1948	-	150	3,286.00
Glidden, Village of	Glidden	Dugout	1959	-	3	1,200.00
Gooseberry Lake	Corning	Stockwatering	1948	-	2,500	8,783.00
Gouverneur Dam	Ponteix	Irrigation	1952	6,000	10,000	242,468.00
Graham-Rogers	Qu'Appelle	Irrigation	1959	140	-	2,463.00
Grattle Grazing Co-op.	Hoosier	Dugout	Incomplete	-	3	951.00
Gravelbourg South	Gravelbourg	Irrigation	1948	600	1,500	8,186.00
Gravelbourg Storage	Gravelbourg	Irrigation	1947	500	-	1,917.00
Grosnick	Lake Alma	Stockwatering Dugout	1957	-	1.5	1,000.00
Gunn Grazing Co-op.	Shaunavon	Multi-purpose Res.	1957	-	10	1,632.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Hague Dugout	Hague	Stockwatering	1950	-	2	1,000.00
Hodgeville	Hodgeville	Stockwatering	1949	-	5	2,748.00
Hanley	Hanley	Stockwatering	1946	-	60	3,797.00
Harris Reservoir	Maple Creek	Irrigation	1956	1,000	5,000	238,074.00
Haunted Hills Grazing Co-op.	Moose Jaw	Stockwatering Dam	1959	-	10	1,640.00
Hoosier, Hamlet of	Hoosier	Dugout	1959	-	3	1,190.00
Hugonard Coulee Dam	Lebret	Multi-purpose Dam	1956	100	400	64,231.00
Jackfish Creek	Meota	Stockwatering Dam	1943	-	90	2,940.00
Jumping Deer Creek	Lipton	Stockwatering	1947	-	145	6,092.00
Kaposvar	Stockholm	Stockwatering	1947	-	290	11,946.00
Kaposvar Creek	Melville	Stockwatering Dam	1954	-	1,400	102,747.00
Katepwa Weir	Katepwa	Dam	1957	-	-	61,192.00
Kelfield	Kelfield	Stockwatering	1947	-	25	4,927.00
Kerrobart	Kerrobart	Multi-purpose Res.	1957	-	40	11,554.00
Kincaid	Kincaid	Stockwatering	1956	-	10	2,539.00
Kindersley	Kindersley	Stockwatering	1949	-	300	2,007.00
Kisbey Flats	Kisbey	Irrigation	1939	2,300	5,000	23,211.00
Koch-Froh	Qu'Appelle	Multi-purpose Res.	1956	160	-	2,390.00
Lac Pelletier	Lac Pelletier	Stockwatering Dam	1937	-	3,350	2,139.00
Lacadena	Lacadena	Irrigation	1954	-	-	9,678.00
Lafleche	Lafleche	Stockwatering Dam	1940	-	38	2,524.00
Lafleche Dam	Lafleche	Multi-purpose Dam	1957	15,000	30,120	627,922.00
Lajord	Lajord	Dam	1936	-	300	13,800.00
Lake of the Rivers	Assiniboia	Stockwatering Dam	1938	-	300	10,805.00
Lancer Water Users	Lancer	Irrigation	1953	1,265	-	35,000.00
Langenburg	Langenburg	Irrigation & Dam	1949	800	200	11,752.00
Langenburg	Langenburg	Irrigation	1954	-	2.5	3,000.00
Larsen	Radville	Multi-purpose Dam	1957	-	500	36,437.00
Last Mountain Lake	Qu'Appelle Valley	Irrigation	1941	x	-	42,721.00
Lebret	Qu'Appelle Valley	Irrigation	1941	x	-	16,307.00
Lemsford	Lemsford	Stockwatering Dugout	1957	-	1.5	1,000.00
Little Manitou Lake	Watrous	Dam	1957	-	-	39,271.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Lonesome Lake	Vidora	Irrigation	1949	900	800	2,771.00
Long Creek #1	Estevan	Stockwatering Dam	1938	-	137	8,729.00
Long Creek #2	Estevan	Stockwatering Dam	1938	-	90	8,701.00
Loon Creek	Markinch	Stockwatering Dam	1945	-	700	7,180.00
Lucky Lake	Lucky Lake	Stockwatering	1946	-	120	7,596.00
McIntosh Slough	Golden Prairie	Irrigation	1949	500	1,500	1,990.00
Macklin Storage	Macklin	Stockwatering	Incomplete	-	40	967.00
Maple Creek	Maple Creek	Irrigation	1938	10,000	23,260	356,179.00
Maple Grove	Goodwater	Dam	1959	-	330	5,988.00
March Flood Irrigation	Cedoux	Irrigation	1948	400	-	1,765.00
Masefield	Masefield	Stockwatering	1938	-	40	3,187.00
Masefield Water Users	Masefield	Multi-purpose Dam	1957	500	250	7,999.00
Matador	Matador	Irrigation & Dam	1946	120	220	5,216.00
Maymont	Maymont	Dugout	1959	-	1.5	1,200.00
Maxim Lake	Maxim	Stockwatering	1949	-	5,000	20,472.00
McCreaney, R.M. of	Kenaston	Stockwatering Dam	1937	-	350	1,896.00
McDonald Creek	McCord	Irrigation & Dam	1950	400	90	4,992.00
McGurk Lake	Carlyle	Dam	Incomplete	-	800	1,846.00
Meadowland	Macklin	Irrigation	1954	500	-	6,370.00
Meeting Lake	Redfield	Stockwatering	1949	-	100	2,683.00
Melaval	Melaval	Stockwatering	1950	-	18	1,200.00
Meota, R.M. of	Meota	Dugout	1953	-	1.5	1,000.00
Middle Creek	Battle Creek	Irrigation	1937	1,000	20,000	18,663.00
Mine Coulee	Neptune	Stockwatering	1948	-	40	4,377.00
Miry Creek, R.M. of	Abbey	Dam	Incomplete	-	20	4,680.00
Montague Lake	Assiniboia	Irrigation	1953	235	-	1,000.00
Moose Jaw Creek	Lang	Irrigation	1938	2,250	2,180	7,618.00
Moose Mountain	Corning	Irrigation	1937	-	8,000	14,829.00
Moosomin Dam (Keenan Bridge)	Moosomin	Multi-purpose Dam	1954	-	9,000	449,184.00
Muenster	Muenster	Irrigation	1949	25	11	2,754.00
Neudorf	Neudorf	Multi-purpose Res.	1958	-	-	1,790.00
Newburn Lake	Invermay	Irrigation & Dam	1952	50	1,280	6,477.00
North Hebert Extension	Herbert	Irrigation	Incomplete	-	-	511,909.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Acres Feet	Costs
North Portal	North Portal	Dugout	1959	-	2	1,810.00
North Qu'Appelle	Fort Qu'Appelle	Stockwatering Dam	1948	-	100	2,386.00
Orkney	Orkney	Stockwatering Dam	1958	-	10	1,982.00
Oxbow Dam	Oxbow	Irrigation	1941	3,900	3,200	17,436.00
Pangman	Pangman	Multi-purpose Res.	1957	30	125	5,533.00
Pasqua	Moose Jaw	Stockwatering	1948	-	40	3,777.00
Pike Lake	Vanscoy	Irrigation & Dam	1948	900	2,500	7,360.00
Pipestone Lake	Broadview	Stockwatering Dam	1938	-	1,600	11,785.00
Pheasant Creek	Lemberg	Storage	1954	-	500	114,464.00
Poplar River	Coronach	Irrigation & Dam	1950	300	900	14,838.00
Portreeve	Portreeve	Stockwatering Dugout	1957	-	1.5	1,000.00
Primate	Primate	Stockwatering Dugout	1957	-	1.5	1,000.00
Radville	Radville	Stockwatering	1947	-	32	5,019.00
Reciprocity	Glen Ewen	Irrigation & Dam	1949	2,000	1,750	27,410.00
Redford	Wilkie	Stockwatering	1951	-	160	1,814.00
Richman Irrigation	Glen Bain	Irrigation	1949	-	1,000	4,607.00
Richardson-McKinnon	Consul	Irrigation	1946	3,000	-	53,913.00
Ridgeway Flats	Qu'Appelle	Multi-purpose	1957	65	80	2,054.00
Rinfret	Weyburn	Dugout	1959	-	6	6,997.00
Rockglen Grazing	Rockglen	Irrigation & Dam	1955	600	300	13,455.00
Rosedale	Hanley	Irrigation	1948	60	100	1,016.00
Rosthern Water Storage	Rosthern	Storage Dam	1958	-	160	22,613.00
Rough Bark Creek	Goodwater	Stockwatering Dam	1937	-	1,500	9,314.00
Round Hill Water Users	N. Battleford	Irrigation & Dam	1950	425	50	4,791.00
Ruddell, Village of	Ruddell	Dugout	1959	-	1.5	1,000.00
Russell Creek	Pambrun	Irrigation	1951	1,000	2,000	66,493.00
Saline	Invermay	Multi-purpose Res.	1958	1,000	-	2,377.00
Salvador	Reward	Stockwatering	1951	-	5	1,000.00
Saskatoon	Saskatoon	Storage Dam	1940	-	1,200	290,446.00
Sauder	Rush Lake	Storage & Irrigation	1949	-	800	29,115.00
Scotsguard	Scotsguard	Irrigation & Dam	1949	2,000	3,000	1,962.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Scotsguard	Shaunavon	Stockwatering Dugout	1958	—	3	1,857.00
Shaheen	Rush Lake	Storage & Irrigation	1949	—	300	9,028.00
Shackleton, Village of	Shackleton	Dugout	1959	—	1.5	1,500.00
Shrimp Lake	Herschel	Stockwatering	1947	—	450	9,367.00
Sinfield	Kelvington	Multi-purpose Res.	1957	10	—	3,177.00
Skyeta, Com.	Springside	Dam	1959	—	15	3,885.00
Sioux Reserve	Fort Qu'Appelle	Stockwatering	1949	—	75	8,605.00
Smiley, Village of	Smiley	Dugout	1949	—	1.5	1,000.00
Smiley	Smiley	Irrigation & Dam	1951	600	300	9,998.00
Snake Bite	Beechy	Irrigation	1954	665	—	9,999.00
Snipe Lake	Eston	Stockwatering	1949	—	—	3,415.00
Snowdown Grazing Co-op	Fox Valley	Dugout	1959	—	1.5	1,898.00
Souris-Estevan	Estevan	Irrigation	1941	—	—	91,133.00
Souris River	Weyburn	Flood Control	1948	—	—	11,998.00
South Abernethy Project	Abernethy	Irrigation	1956	320	—	14,568.00
Spangler Project	Govenlock	Irrigation	1948	1,500	2,100	4,950.00
Stelcam Community Dam	Stelcam	Stockwatering	1956	—	360	9,791.00
Stephens Dam	Abernethy	Stockwatering	1948	—	12	8,716.00
Sturgis Community Dam	Sturgis	Stockwatering	1950	—	60	20,961.00
Summerberry	Summerberry	Multi-purpose Res.	1956	427	—	6,824.00
Summercove	Mankota	Irrigation & Dam	1949	1,200	1,500	23,837.00
Summit Creek	Bridgeford	Irrigation & Dam	1949	800	3,000	13,227.00
Sunbeam Creek	Indian Head	Multi-purpose Res.	1957	100	300	5,216.00
Swift Current	Swift Current	Irrigation	1946	30,000	95,000	816,472.00
Talmage	Cedoux	Irrigation	1948	1,600	—	3,483.00
Tantallon	Tantallon	Stockwatering Dam	1942	—	—	2,790.00
Tatagwa Lake	Weyburn	Flood Irrigation	1958	10,000	—	28,840.00
Terrell, R.M. of	Spring Valley	Stockwatering	1952	—	10	2,491.00
Thunder Creek	Kettlehut	Flood Irrigation	1948	—	—	27,204.00
Thunder Creek Channel	Moose Jaw	Irrigation & Dam	1951	300	7,000	10,007.00
Tilney	Tilney	Multi-purpose Res.	1958	—	100	8,308.00
Tribune Dam	Tribune	Stockwatering	1950	—	300	6,499.00
Truax	Truax	Stockwatering	1949	—	250	11,899.00
Tuxford	Tuxford	Flood Irrigation	1957	800	—	7,320.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Twelve Mile Lake Tyvan	Maxstone Tyvan	Flood Irrigation Stockwatering	1956 1947	- -	- 1,000	7,998.00 11,986.00
Val Marie	Val Marie	Irrigation	1937	5,920	7,000	214,558.00
Val Marie West (including new spillway 1959)	Val Marie	Irrigation	1940	4,230	2,000	321,586.00
Valeport Dyke	Valeport	Dam	1958	1,500	-	139,748.00
Valley Park Irrigation	Valley Lake	Irrigation	1949	1,200	-	8,133.00
Verwood	Verwood	Stockwatering Dam	1958	-	16	1,414.00
Weed Creek	Broadview	Flood Irrigation	1958	2,000	-	3,099.00
West Osage	Cedoux	Irrigation & Dam	1949	300	600	4,905.00
West Poplar #1	Kildeer	Multi-purpose Res.	1957	750	1,000	16,230.00
Weyburn	Weyburn	Irrigation	1940	-	4,000	51,311.00
Wheatlands, R.M. of	Parkbeg	Irrigation & Dam	1951	100	60	3,452.00
White Gull Lake	Gull Lake	Flood Irrigation	1958	263	-	1,743.00
Wilson Lake	Lizard Lake	Multi-purpose Res.	1956	400	-	2,813.00
Wittrock	Hodgeville	Irrigation	1947	520	-	3,884.00
Wolseley	Wolseley	Stockwatering	1948	-	20	1,800.00
Wolverine Creek	Humboldt	Stockwatering Dam	1945	-	522	52,600.00
Wood Mountain	Willow Bunch	Irrigation & Dam	1951	40	60	6,337.00
Woodrow - Pinto Creek	Woodrow	Irrigation	1949	1,000	1,400	41,982.00
Wood River Development	Coderre and Gravelbourg	Stockwatering Dam	1942	-	4,923	33,738.00
Wynn Community Project	Wolseley	Multi-purpose Res.	1957	500	-	3,152.00
Wynyard	Wynyard	Stockwatering	1947	-	35	6,225.00
Young	Young	Stockwatering	1948	-	250	8,892.00

x - Ultimate irrigation development for all projects along Qu'appelle  
River Valley 30,000 - (total storage capacity - 95,600 acre feet).



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Acadia Valley	Acadia Valley	Dugout	1953	-	1.5	2,252.00
Acadia Valley #2	Acadia Valley	Dugout	1954	-	1.5	1,000.00
Aetna Irrigation District	Aetna	Irrigation	1947	8,000	-	82,004.00
Airdree	Calgary	Multi-purpose Res.	1958	-	200	9,789.00
Ambrose Flats	Irvine	Irrigation	1951	800	1,000	4,781.00
Anatole	Hanna	Stockwatering	1953	-	7	2,990.00
Antelope Park	Nemiscam	Stockwatering Dugout	1957	-	1.5	1,000.00
Argyle, M.D. of	Staveley	Stockwatering	1949	-	80	10,912.00
Atlee Gas Well #1	Atlee	Irrigation (pump)	1939	7,000	-	12,423.00
Atlee Gas Well #2	Atlee	Irrigation (pump)	1939	-	-	14,300.00
Atlee Buffalo	Atlee	Dugout	1959	-	9	5,700.00
Badger Lake	Lomond	Stockwatering	1948	-	10	2,990.00
Bain Community	Foremost	Dugout	1959	-	10.5	6,800.00
Balzac	Balzac	Irrigation	1956	900	-	8,141.00
Bare Creek	Comrey	Irrigation & Dam	1950	-	500	11,600.00
Bare Creek #2	Comrey	Multi-purpose Dam	1956	1,000	1,100	13,029.00
Bartman Dam	Cessford	Irrigation	1943	1,000	3,000	49,100.00
Beautyland	Bindloss	Dugout	1959	-	6	1,500.00
Beauvais Lake	Pincher Creek	Irrigation	1950	2,000	2,400	15,996.00
Beaver Dam Creek Reservoir	Castor	Stockwatering	1950	-	300	17,996.00
Bedford Slough	Medicine Hat	Irrigation	Incomplete	3,000	200	35,493.00
Bell Lake	Pollockville	Irrigation	1949	700	1,500	4,738.00
Berry Creek	Carolside	Irrigation	1948	10,000	30,000	158,884.00
Bircham	Calgary	Flood Irrigation	1958	1,200	-	8,295.00
Bluefield Grazing Assoc.	Thelma	Stockwatering	1956	-	30	3,500.00
Bowell	Bowell	Dugout	1954	-	1.5	1,000.00
Bow Island	Bow Island	Stockwatering Dam	1958	-	1.5	1,000.00
Bowmanton	Bowmanton	Stockwatering	1953	-	500	14,860.00
Brunswick Coulee	Enchant	Irrigation	1949	500	205	4,631.00
B.T. Grazing Co-op.	Hilda	Stockwatering	1956	-	3	1,000.00
Bull Pound Creek	Hanna	Stockwatering Dam	1939	-	2,000	-

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs	
Lewis	Vulcan	Irrigation & Dam	1953	350	—	4,345.00	
Lochend Lake	Calgary	Dam & Irrigation	1958	1,600	1,100	7,750.00	
Lomand	Lomand	Dugout	1959	—	3	1,000.00	
Loveland	Hanna	Irrigation	1954	3,000	—	17,655.00	
Loyalist Creek	Hanna	Irrigation	1950	2,000	1,400	14,993.00	
Lundbreck	Pincher Creek	Stockwatering	1953	—	100	4,689.00	
McArthur	Walsh	Dam	1959	—	700	14,565.00	
McAlpine Reservoir	Walsh	Irrigation	1951	600	1,000	15,917.00	
McGregor Dam	Vulcan	Irrigation	1951	1,500	700	9,473.00	
McLaren	Michichi	Multi-purpose Res.	1957	150	660	13,815.00	
Mackay Dam	Walsh	Irrigation	1952	600	300	9,600.00	
Magrath	Magrath	Irrigation	1939	4,000	—	2,756.00	
Meadow Creek Dam	Claresholm	Irrigation	1952	1,500	—	5,630.00	
Mekastoe	Fort MacLeod	Dam	1959	—	210	4,594.00	
Michelle Creek Project	Thelma	Multi-purpose Res.	1959	—	800	14,791.00	
Milne Community Project	Conrich	Irrigation	1955	1,300	—	9,644.00	
Mountain View	Mountain View	Storage Dam	1936	—	4,200	3,000.00	
Naismith	Youngstown	Multi-purpose Res.	1956	300	145	9,421.00	
Nemiscam	Etzikom	Dugout	1954	—	1.5	1,000.00	
Nester	Cessford	Multi-purpose Res.	1957	300	1,350	8,670.00	
New Brigden	Hanna	Stockwatering Dam	1958	—	60	3,582.00	
Nobleford Water Users	Nobleford	2 Dugouts	1953	—	3	11,173.00	
North Fincastle	Taber	Irrigation & Dam	1948	2,000	4,000	17,943.00	
Osburne Water Conservation	Iddesleigh	Dam	1959	—	210	9,495.00	
Oyen	Oyen	Stockwatering Dugout	1957	—	1.5	1,000.00	
Parfles	Chancellor	Irrigation	1954	250	—	4,730.00	
Peace Butte Reservoir	Peace Butte	Stockwatering	1955	450	550	8,993.00	
Pershing Dam	Glenwood	Irrigation	1951	100	200	4,782.00	
Pirmez Creek	Pirmez Creek	Irrigation	1951	6,000	500	20,998.00	
Porcupine Hills	Fort MacLeod	Dugout	1959	—	1.5	4,599.00	
Pothole Coulee	Magrath	Irrigation	1948	Part of St. Mary Project			8,802.00
Priddis	High River	Stockwatering	1955	—	312		



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Provost, Village of	Provost	Multi-purpose Dam	1956	-	3	4,812.00
Ranchville Community Res.	Ranchville	Irrigation	1957	300	-	4,950.00
#Raymond	Raymond	Irrigation	1943	3,000	1,600	6,000.00
Reid Hill	Vulcan	Irrigation	1952	1,000	700	8,866.00
Rock Lake Project	Brooks	Irrigation	1957	11,000	-	133,984.00
#Rolling Hills	Rolling Hills	Irrigation	1938	25,000	-	46,839.00
Rose Glen Water Users	Schuler	Multi-purpose Dam	1957	200	150	6,884.00
Ross Creek	Irvine	Irrigation	1950	3,000	5,000	47,998.00
Ross Lake Community	Raymond	Stockwatering	1950	-	300	7,987.00
Rough Meadow Reservoir	Coronation	Irrigation	1951	200	-	2,471.00
Ruks	Pincher Creek	Irrigation & Dam	1954	900	250	6,484.00
Schuler Water Users	Schuler	Multi-purpose Res.	1957	-	5	5,443.00
Serviceberry Creek	near Drumheller	Irrigation	1949	1,200	500	17,518.00
Seven Persons	Seven Persons	Stockwatering Dam	1943	-	800	12,103.00
Severn Creek	Rosebud	Irrigation & Dam	1950	1,000	1,000	24,990.00
Sheerness Grazing (Blois)	Roselynn	Stockwatering	1953	-	12	3,797.00
Sheerness #2	Roselynn	Stockwatering	1954	-	50	2,190.00
Snake Creek	Calgary	Irrigation & Dam	1950	500	300	15,976.00
Spondin	Hanna	Dugout	1955	-	1.5	1,000.00
Spruce Coulee	Elkwater	Stockwatering Dam	1959	-	1,000	12,496.00
Starland, M.D. of	Morin	Stockwatering	1956	-	45	3,196.00
Stehr Coulee	Walsh	Multi-purpose Res.	1956	-	26	4,570.00
Sounding Creek	Cereal	Irrigation	1949	8,000	5,600	51,988.00
South Macleod	Macleod	Irrigation	1948	6,000	-	82,614.00
Squaw Coulee	High River	Irrigation	1949	2,000	455	17,999.00
Sundial	Champion	Dugout	1959	-	6	3,102.00
Swalwell	Swalwell	Multi-purpose Res.	1957	280	300	9,463.00
Three Hills	Three Hills	Stockwatering	1948	-	120	19,652.00
Twin Lakes	Chancellor	Irrigation	1954	500	-	12,498.00
Twin River Grazing	Twin River	Stockwatering	1953	-	125	4,486.00
Two Lakes	Elkwater	Multi-purpose Res.	1958	1,500	1,900	14,378.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Vulcan Dam	Vulcan	Irrigation	1951	400	150	3,997.00
Vauxhall	Vauxhall	Stockwatering	1948	-	30	5,883.00
Waddington	Vale	Multi-purpose Res.	1957	-	12	2,904.00
Walsh Flats	Walsh	Irrigation	1953	2,100	25,000	4,700.00
Watts Flats						
(Bull Pound-Lone Butte)	Watts	Flood Irrigation	1958	2,000	-	6,147.00
Wheatacre #2	Rockyford	Irrigation	1952	-	-	4,744.00
Wheatacre Dam	Rockyford	Irrigation	1950	1,600	1,500	12,976.00
Wild Horse Storage	Cressday	Irrigation	1936	3,600	4,500	24,370.00
Wintering Hills	Hussar	Irrigation	1950	1,000	500	9,993.00
Wisdom Water Users	Medicine Hat	Multi-purpose Res.	1957	420	500	14,403.00
Woolford Community Project	Cardston	Irrigation	1955	400	-	3,593.00
Writing on Stone	Milk River	Dugout	1959	-	6	8,291.00
Yeast Reservoir	Thelma	Irrigation	1953	400	800	6,592.00

# - P.F.R.A. gave assistance to a project already in existence to improve storage capacities, canals and distribution systems.



# APPENDIX V

## CUMULATIVE STATEMENT

Development and Operation of Community Pastures under the  
Prairie Farm Rehabilitation Act  
1938 to March 31, 1960

Fiscal Year	No. of Pasture Units in Opera- tion	Area of Land in Pastures (acres)	Total Cost of Construction of Pastures \$	Livestock Units Carried on Pastures	X Acres per Unit of Live- stock	Cost of Operation		Net Opera- ting Cost per Unit of Livestock \$	Average Charge per Unit Live- stock to Farmers \$
						Revenue \$	Operating Costs \$		
1938-39	14	189,800	165,995.03	3,231	58.7	6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1	21,632.71	20,945.84	1.82	1.88
1940-41	35	884,500	1,004,305.91	23,245	38.1	43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2	65,434.89	50,607.22	1.52	1.97
1942-43	45	1,261,100	1,129,487.54	51,127	24.7	98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3	111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,699,012.21	59,997	22.3	151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1	167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6	198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4	203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1	204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5	211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1	221,129.45	217,867.15	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4	335,327.16	237,742.13	3.08	4.34
1952-53	59	1,652,020	3,754,098.41	94,137	17.5	438,513.75	373,737.36	3.97	4.66
1953-54	60	1,678,736	3,963,572.83	109,583	15.3	507,179.14	490,807.89	4.48	4.55
1954-55	60	1,696,900	4,273,916.79	106,322	15.9	496,805.78	466,153.69	4.38	4.66
1955-56	60	1,728,700	4,509,668.59	108,499	15.8	499,045.13	501,540.73	4.67	4.60
1956-57	61	1,759,570	4,832,863.47	117,441	14.9	548,601.01	508,002.83	4.33	4.67
1957-58	61	1,796,275	5,119,317.01	119,398	15.0	552,938.40	607,129.23	5.08	4.63
1958-59	62	1,815,265	5,509,958.43	117,032	15.5	542,606.90	686,448.88	5.87	4.64
1959-60	64	1,818,464	5,800,342.43	124,812	14.6	705,785.32	742,915.21	5.95	5.65
						6,330,343.94	6,045,133.22		

x - A livestock unit indicates one head of cattle, one horse, or five sheep.

A pasture unit may include one or more pastures, but it is operated under one management.

## APPENDIX VI

## P.F.R.A. COMMUNITY PASTURES IN OPERATION DURING THE FISCAL YEAR ENDED MARCH 31, 1960

Community Pasture & Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1959	Accumulated Cost of Construction March 31, 1960	1959-60 Stock Pastured	
				Cattle	Horses
SASKATCHEWAN					
Coalfields #4, North Portal	32,380	156,091.66	163,997.39	3197	49
Estevan-Cambria #5-6, Macoun	6,720	18,168.68	18,856.56	409	6
Masefield #17, Orkney	36,320	101,739.39	115,431.66	1657	-
Lone Tree #18, Bracken	33,600	96,446.71	96,816.71	2079	33
Battle Creek #20, Divide	66,880	131,504.61	165,363.82	2733	51
Nashlyn #21, Consul	61,520	87,867.36	92,704.07	2564	3
Govenlock #22, Govenlock	68,800	108,454.45	113,034.45	2116	10
Lomond #37, Pasture #1, Goodwater	23,360	81,082.37	86,149.83	2946	33
Lomond #37, Pasture #3, Maxim	18,400	77,448.68	83,139.62	1275	22
Laurier #38, Lomond #37 - #2, Radville	37,175	106,043.98	108,999.43	2666	80
The Gap #39, Ceylon	13,920	84,564.76	88,258.98	1260	50
Val Marie #47, Val Marie	110,000	267,268.77	276,438.53	7712	19
Beaver Valley #47A, Val Marie	57,680	25,810.86	25,810.86	625	-
Reno #51, Pasture #1, Robsart	17,120	61,733.54	63,533.54	1071	8
Reno #51, Pasture #2, Consul	11,360	29,234.38	29,877.83	671	-
Tecumseh #65, Forget	18,400	77,298.59	80,867.55	1526	25
Brokenshell #68, Pasture #1, Yellow Grass	22,720	95,390.20	101,634.48	1751	65
Brokenshell #68, Pasture #2, Weyburn	8,160	15,458.47	16,060.94	307	2
Excel #71, Ormiston	20,500	96,260.44)	71,620.87	1834	-
Key West #70, Kayville	10,240	)	35,019.95	892	-
Auvergne-Wise Creek #76-77, Cadillac	42,880	140,328.90	140,908.90	3480	5
Wellington #97, Tyvan	25,360	111,148.25	112,798.36	1928	38
Caledonia-Elmsthorpe #99-100, Milestone	26,400	118,692.02	119,105.66	1403	59
Shamrock #134, Shamrock	26,080	86,319.76	87,126.19	1568	-
Swift Current-Webb #137-8, Swift Current	18,720	81,878.71	83,526.75	1825	-
Gull Lake #139, Tompkins	10,720	32,362.21	32,362.21	651	-
Big Stick #141, Maple Creek	18,160	44,197.75	45,456.24	1464	-
Bitter Lake #142, Maple Creek	47,410	119,809.80	124,616.36	2980	-



Community Pasture & Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1959	Accumulated Cost of Construction March 31, 1960	1959-60	
				Cattle	Stock Pastured Horses Sheep

### Pasture Units

### SASKATCHEWAN - (Cont'd.)

Spy Hill # 152, Welby (operated in con- junction with Ellice, Man.)	19,570	55,322.52	58,080.61	2504	37
Elbow # 223-4, Elbow	30,080	80,810.89	80,810.89	1929	73
Beaver Hills # 245-6, Homefield P.O.	44,160	118,069.01	139,106.59	4443	197
Willner # 253, Davidson	13,280	81,709.05	83,951.32	1639	-
Coteau # 255, Birsay	27,520	64,191.82	64,191.82	1610	19
Monet # 257, Elrose	46,840	111,548.24	111,548.24	2814	37
Fairview # 258, Chipperfield	17,000	115,260.23	120,035.08	1234	-
Newcombe # 260, Glidden	52,960	167,020.63	174,521.22	4044	27
Mantario # 262, Empress, Alta.	24,960	70,406.80	75,479.98	1985	-
Cote, Togo	10,080	41,609.23	72,036.12	944	2
Mount Hope-Prairie Rose # 279-309	31,540	98,440.84	108,690.49	1810	-
Wreford # 280, Hatfield	13,440	81,055.40	81,953.33	1101	-
McCraney # 282, Davidson	10,720	69,677.74	69,677.74	1307	-
Rudy-Rosedale # 284-3, Broderick	19,200	90,057.21	90,182.57	1554	48
Hillsburgh # 289, Brock	13,600	56,439.48	56,700.27	944	-
Eagle Lake # 289-319, Netherhill	23,249	91,445.69	91,923.67	1219	6
Kindersley-Elma # 290-1, Smiley	21,400	112,394.62	116,329.00	1655	26
Usborne # 310, Venn	12,680	46,018.57	57,171.79	1495	-
Dundurn # 314, Dundurn	44,840	113,477.54	113,796.29	2372	- 620
Montrose # 315, Donavon	21,600	67,005.91	78,176.02	1103	-
Oakdale # 320, Beaufield	20,800	62,470.08	64,738.08	1429	17
Antelope Park # 322, Hoosier	34,320	106,910.60	111,225.88	2848	48
Wolverine # 340, Plunkett	17,280	73,320.05	73,594.20	1940	-
Mariposa # 350, Kerrobert	26,880	93,370.29	95,256.40	1793	-
Progress # 351, Kerrobert	19,680	65,149.48	66,968.47	1507	-
Heart's Hill # 352, Compeer, Alta.	15,100	58,931.77	60,927.33	1719	-
Park # 375, Langham	7,040	22,633.89	22,633.89	411	-
Battle River-Cutknife # 438-9, Gallivan	30,480	86,009.64	91,481.39	1179	35

Community Pasture & Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1959	Accumulated Cost of Construction March 31, 1960	1959-60	
				Cattle	Stock Pastured Horses Sheep

### Pasture Units

#### SASKATCHEWAN - (Cont'd.)

Royal #465, Marcelin	65,120	213,512.64	228,106.43	3092	69
Paynton #470, Paynton	24,480	79,542.32	84,987.55	1426	25
Totals for Saskatchewan	1,650,884	5,046,437.48	5,323,800.40	109,640	1,224 620

#### Special Project - Bitter Lake Irrigation included in Bitter Lake Pasture

### Pasture Units

#### MANITOBA

Ellice Pasture, Welby, Sask. (operated in conjunction with Spy Hill #152)	20,320	28,746.37	28,746.37	-	-	2300
Archie Pasture, Welwyn, Sask.	39,740	92,093.20	95,100.33	2282	16	
Portage Pasture, Poplar Point	14,640	44,793.85	44,793.85	2336	40	
Woodlands Pasture, Poplar Point	20,960	69,793.13	70,180.39	2838	85	
Lakeview Pasture, Langruth	29,280	80,724.71	81,122.96	2091	7	
Westbourne Pasture, Gladstone	11,520	42,592.62	49,247.79	1773	13	
Langford Pasture, Neepawa	19,680	71,097.44	73,670.71	1860	23	
San Clara	8,160	33,679.63	33,679.63	-	-	
Wallace Pasture, Elkhorn	3,280	(Operated by R.M. Wallace)				
Totals for Manitoba	167,580	463,520.95	476,542.03	13,180	184	2300
GRAND TOTALS	1,818,464	5,509,958.43	5,800,342.43	122,820	1,408	2920



# APPENDIX VII

## MAJOR PROJECTS – IRRIGATION, RECLAMATION AND WATER STORAGE

(Projects by Special Votes of Parliament, Administered by P.F.R.A., to March 31, 1960)

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
MANITOBA						
Assiniboine River Diking & Cut Off	Brandon	River Control	Incomplete	—	—	1,018,423.00
North-West Escarpment Reclamation Proj.-Riding Mt. Area	Dauphin	Watershed Control	Incomplete	—	—	1,024,363.00
Saskatchewan River Reclamation — Pasquia Area	The Pas	Reclamation	Incomplete	135,000	—	2,193,777.00
ALBERTA						
Bow River	Medicine Hat	Irrigation	Incomplete	235,000	408,862	54,398.00
(a) Purchase of Canada Land & Irrigation Company						2,353,182.00
(b) Development & Construction						20,915,630.00
St. Mary	Lethbridge	Irrigation	Incomplete	510,000	320,000	14,061,084.00
Belly River Diversion	Lethbridge	Irrigation	1950	—	—	53,901.00
BRITISH COLUMBIA						
Cawston Benches	Keremeos	Irrigation (pump)	1951	629	2,000	185,491.00
Chase & Johnston — Western Canada Ranching	Kamloops	Irrigation	1951	755	—	98,243.00
Western Canada Ranching #2	Kamloops	Irrigation (pump)	1950	54	—	58,069.00
Lillooet — Pemberton	Pemberton	River Control	1953	—	—	1,056,539.00
South Thompson — Niskonlith Gravity Project	Kamloops	Irrigation	Incomplete	1,030	1,200	12,282.00
Westbank Project	Kelowna	Irrigation	1950	1,200	2,500	537,450.00
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	—	32,229.00
Penticton West Bench	Penticton	Irrigation (pump)	1953	800	—	66,362.00
B.C. Fruitlands	Kamloops	Irrigation	Incomplete	2,000	—	200,000.00

(Above includes ONLY Construction Costs)

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
SASKATCHEWAN						
South Saskatchewan River Project	Outlook	Multi-purpose	Incomplete	500,000 (Including 24,000 in Qu'Appelle extension)	-	6,373,658.00
(Above includes ONLY Construction Costs)						



APPENDIX VIII  
PRAIRIE FARM REHABILITATION ACT – EXPENDITURES BY ACTIVITIES  
April 1, 1935 – March 31, 1960

		<u>1935–1959</u>	<u>1959–1960</u>	<u>Total</u>
ADMINISTRATION				
Ottawa Administration	(a)	371,716	32,345	404,061
Regina Administration	(b)	1,644,984	174,480	1,819,464
	Total	<u>2,016,700</u>	<u>206,825</u>	<u>2,223,525</u>
EQUIPMENT				
Purchase of Equipment	(k)	1,677,192	212,421	1,889,613
Upkeep of Equipment	(k)	1,107,474	95,942	1,203,416
Equipment Depot		2,526,691	315,630	2,842,321
	Total	<u>5,311,357</u>	<u>623,993</u>	<u>5,935,350</u>
LAND UTILIZATION				
Supervision		735,155	47,246	782,401
Construction of Community Pastures		7,963,060	548,496	8,511,556
Pasture Improvements		563,023	82,935	645,958
Operation of Community Pastures		5,772,018	781,359	6,553,377
Purchase of Bulls		691,505	69,720	761,225
Re-establishment of Farmers	(m)	–	–	–
Grass Seeding & Experimental Regrassing		<u>738,927</u>	<u>17,623</u>	<u>756,550</u>
	Total	<u>16,463,688</u>	<u>1,547,379</u>	<u>18,011,067</u>
WATER DEVELOPMENT				
Supervision		824,831	21,234	846,065
Small Projects including Engineering		17,879,944	1,471,771	19,351,715
Large Irrigation and Storage Projects				
Supervision	(d)	1,930,578	79,554	2,010,132
Construction and Improvements	(c&e)	9,175,902	719,561	9,895,463
Maintenance and Operation		6,557,544	275,882	6,833,426
Re-establishment of Farmers	(n)	222,537	5,304	227,841
Surveys and Explorations	(f&h)	1,660,484	–	1,660,484
Purchase of Land		<u>764,544</u>	<u>1,714</u>	<u>766,258</u>
	Total	<u>39,016,374</u>	<u>2,575,020</u>	<u>41,591,384</u>
Cultural work for soil drifting control and related problems prior to April 1, 1946 (under administration of Experimental Farms Service).		4,966,394	–	4,966,394
GRAND TOTAL		<u>67,774,503</u>	<u>4,953,217</u>	<u>72,727,720</u>

# SPECIAL VOTES UNDER P.F.R.A. ADMINISTRATION

	<u>1935-1959</u>	<u>1959-1960</u>	<u>Total</u>
Assiniboine and Qu'Appelle Rivers, Surveys and Construction	1,146,684	34,869	1,181,553
Lillooet Project B.C. Construction and Exploration	1,170,133	-	1,170,133
Land Reclamation & Development in B.C. (i)	2,115,810	24,239	2,140,049
St. Mary Irrigation Project - Alberta (i)	20,209,414	748,123	20,957,537
Bow River Project - Alberta	27,056,781	1,184,095	28,240,876
Red Deer River Project - Alberta (g)	1,047,061	20,668	1,067,729
Eastern Irrigation District - Alberta	-	35,793	35,793
Rivers Dam - Manitoba	444,436	522,975	967,411
Other Miscellaneous Projects - Construction	210,392	-	210,392
Soil Mechanics Building	103,769	370,442	474,211
Land Protection & Reclamation - Manitoba	3,118,144	128,771	3,246,915
South Saskatchewan River Project - Saskatchewan (o&g)	5,897,340	6,615,070	12,512,410
Buffalo Pound Project - Saskatchewan	1,818,174	133,100	1,951,274
Surveys and Engineering Costs (l)	12,229,132	1,813,271	14,042,403
GRAND TOTAL	<u>76,567,270</u>	<u>11,631,416</u>	<u>88,198,686</u>

- (a) Included in Cultural Administration to March 31, 1938.
- (b) Included in Water Development Administration to March 31, 1938.
- (c) Includes \$388,923.57 expended under the Supplementary Public Works Construction Act, 1935.
- (d) Includes \$95,198.65 expended on St. Mary River Project (administration) in 1946-47.
- (e) Includes \$300,879.29 expended on St. Mary River Project (construction) in 1946-47.
- (f) Includes \$147,530.22 expended on St. Mary River Project (administration) in 1947-48.
- (g) The amounts shown include Red Deer \$325,642 and South Saskatchewan \$370,093 provided by Department of Reconstruction. In addition, the following amounts were paid from P.F.R.A. Vote: South Saskatchewan - \$59,568; Red Deer - \$33,207.
- (h) General Survey charges now being paid from other P.F.R.A. Votes.
- (i) Amounts shown in Notes (d), (e) and (f) to be added to this total.
- (j) Veteran's Land Act expenditure not included.
- (k) Expenditures until 1949-50 included under Land Utilization and Water Development.
- (l) Previously under P.F.R.A. Vote (see item (g)).
- (m) Re-establishment of farmers now under Water Development.
- (n) Previously under Land Utilization (see item (m)).
- (o) Includes expenditures for Surveys, Investigations, Explorations, Drilling etc., prior to Construction period in an amount of \$4,393,439. This expenditure figure also includes \$124,985, contributed by the Province of Saskatchewan under the terms of the Share Agreement.



APPENDIX IX  
EXPENDITURES BY PROVINCES  
Prairie Farm Rehabilitation Act and Special Votes under its Administration  
April 1, 1935 – March 31, 1960

	<u>Manitoba</u>	<u>Saskatchewan</u>	<u>Alberta</u>	<u>British Columbia</u>
P.F.R.A.	6,097,938	53,379,045	8,482,901	
Major Irrigation and Reclamation in the Prairie Provinces	992,361	15,033,598	50,042,613	
Land Reclamation, Construction and Development in B.C.				3,309,726
Land Protection and Reclamation	3,246,915			
Assiniboine and Qu'Appelle Rivers	1,085,029	96,524		
Surveys and Engineering Costs	2,227,281	7,611,591	4,398,186	154,864
Administration	<u>378,797</u>	<u>2,340,849</u>	<u>1,913,253</u>	<u>134,935</u>
	<u>14,028,321</u>	<u>78,461,607</u>	<u>64,836,953</u>	<u>160,926,406</u>

REVENUE	
Revenue Received from Projects under P.F.R.A. Office to March 31, 1960	
Pasture Operation and General Revenue	6,741,548
Irrigation Project Operation (Under P.F.R.A. Vote)	727,670
Irrigation and General Revenue (Major Projects Vote)	<u>2,474,338</u>
TOTAL	<u>9,943,556</u>

# APPENDIX X TOTAL IRRIGATION DEVELOPMENT - ALBERTA AND SASKATCHEWAN

Project	Year Started	Irrigable Acreage		Major Reservoirs	(Live Storage (Acre Feet))	
		Present	Ultimate Proposals		Present	Ultimate
<u>Mountain &amp; Foothill Region</u>						
United Irrigation District	1921	34,000	34,000	Driggs Lake	7,500	7,500
Mountain View Irrig. District	1925	3,700	3,700			
Leavitt Irrigation District	1943	4,600	4,600			
Aetna Irrigation District	1943	8,300	8,300			
Macleod Irrigation District	1948	3,000	3,500			
Other		12,300	32,700			
		<u>65,900</u>	<u>86,800</u>			
Total						
<u>Western Prairie Region</u>						
St. Mary-Milk River Project	1901	318,200	510,000	St. Mary Reservoir	270,000	270,000
				Chin	165,000	165,000
				Jensen	14,000	14,000
				Ridge	80,000	80,000
				Taber	4,500	4,500
				Fincastle	2,400	2,400
				Horsefly	6,789	6,789
				Grassy Lake	12,000	12,000
				Rattlesnake	4,660	4,660
				Murray	24,830	24,830
				Seven Persons	980	980
				Verdigris	—	110,000
				Waterton	—	130,000
Bow River Irrigation Project	1918	131,000	240,000	Lake McGregor	150,000	250,000
				Travers	100,000	100,000
				Little Bow	12,000	12,000
Western Irrigation District	1908	50,000	50,000	Chestermere	3,000	3,000



Project	Year Started	Irrigable Acreage		Major Reservoirs	(Live Storage (Acre Feet))	
		Present	Ultimate Proposals		Present	Ultimate
Eastern Irrigation District	1914	250,000	281,000	Lake Newell Rock Lake Crawling Valley Keho Berry Creek Res.	90,000 11,000 — 40,000 14,500	100,000 11,000 120,000 40,000 14,500
Lethbridge Northern Irrig. District Berry Creek Project Red Deer River Diversion Proj. (Wm. Pearce Project)	1922 1938 —	96,100 3,000 —	96,100 8,000 250,000			
Other		52,000	201,000			
		900,300	1,636,100			
Total						
Central Prairie Region						
French Flats-Valley Park South Sask. Irrig. Project	1949	830 —	6,000 470,000	South Sask. Delisle Blackstrap	— — —	2,750,000 25,000 25,000
Other		13,300	14,000			
		14,130	490,000			
Total						
Cypress Hills Region						
Eastend-Val Marie Irrig. Proj.	1937	10,000	13,000	Cypress Lake Eastend Val Marie West Val Marie Fifty Mile	80,000 1,600 12,000 4,000 —	100,000 2,000 12,000 4,000 80,000
Consul-Vidora Irrig. Proj. Ross Creek Irrig. Maple Creek Irrig.	1945 1949 1936	5,000 2,000 10,000	10,000 3,000 10,000	Gros Ventre Downie Lake Junction Harris Duncairn Highfield	4,500 10,000 8,400 5,000 85,000 13,000	8,000 10,000 10,000 5,000 85,000 13,000
Swift Current Irrig. Project	1940	5,962	11,457			

Project	Year Started	Irrigable Acreage		Major Reservoirs	(Live Storage (Acre Feet))	
		Present	Ultimate Proposals		Present	Ultimate
Ponteix Project	1953	1,000	7,000	Gouverneur	6,000	10,000
Cadillac Project	1953	500	800	Admiral	1,000	2,500
Russell Creek Project	1951	1,000	1,200	Cadillac	1,350	1,500
Lafleche Project		-	8,000	Russell	1,500	2,000
Other		67,300	98,000	Lafleche	30,000	30,000
		<u>102,762</u>	<u>162,457</u>			
Total						
Eastern Prairie Region						
Lumsden-Fairy Hill Irrig.	1910	8,000	12,000	Buffalo Pound Lake	55,000	130,000
Souris-Estevan-Kisbey Irr. Proj.	1937	5,000	11,000	Dead Lake	3,000	50,000
				Moose Mountain	8,200	8,200
South Saskatchewan						
Extension - Qu'Appelle River		20,000	24,000			
Other total		<u>33,000</u>	<u>81,000</u>			
Total Irrigation (Alberta & Saskatchewan)		<u>1,116,092</u>	<u>2,456,357</u>			





ROGER DUHAMEL, F.R.S.C.  
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY  
OTTAWA, 1961



Nov Dec  
CAI DA 20  
- A56



# Annual Report

on prairie farm rehabilitation  
and related activities



1960  
1961

CANADA DEPARTMENT OF AGRICULTURE







PRAIRIE FARM REHABILITATION

and RELATED ACTIVITIES

1960 - 61





# TABLE OF CONTENTS

	Page
INTRODUCTION .....	
ADMINISTRATION and ORGANIZATION .....	
WATER DEVELOPMENT PROGRAM .....	1
Farm and Community Projects .....	2
Large Water Development Projects .....	4
Neepawa Storage Project .....	4
Souris-Oxbow Weir .....	4
Cabri Dam .....	4
Altawan Dam .....	5
Rivers Water Storage Project .....	6
Technical Assistance .....	7
COMMUNITY PASTURE PROGRAM .....	8
Pasture Operations .....	9
Allocation of Pasturage .....	9
Grazing Rates .....	9
Rates for Vaccine and Other Services .....	10
Haying .....	10
Fires and Fire Protection .....	11
New Pastures .....	11
Breeding Service .....	11
Livestock Diseases .....	11
Livestock Insurance .....	12
Pasture Construction .....	12
Pasture Improvement .....	13
REHABILITATION and RESETTLEMENT .....	15
Eastend Irrigation Project .....	15
Consul Irrigation Project .....	16
West Val Marie Irrigation Project .....	16
Val Marie Irrigation Project .....	18
Swift Current Irrigation Project .....	18
Maple Creek Irrigation Project .....	19
Bow River Resettlement Project .....	20
MAJOR IRRIGATION and RECLAMATION PROJECTS .....	22
St. Mary Irrigation Project .....	22
Engineering Activities .....	24
Project Improvement .....	24
Operation and Maintenance .....	24
Agricultural Development .....	24
Bow River Irrigation Project .....	26
Construction and Maintenance .....	27
Agricultural Development .....	27

# TABLE OF CONTENTS (continued)

	Page
South Saskatchewan River Project .....	28
Design and Planning .....	29
Construction .....	29
Construction Work Force .....	30
Public Relations .....	30
Pre-Development Farm .....	31
Buffalo Pound Lake Water Supply Project .....	33
Emma Lake Conservation Project .....	34
Saskatchewan River Reclamation Project .....	34
Assiniboine River Project .....	35
Northwest Escarpment and Interlake Reclamation Projects.....	36
Fairford River Channel Improvements and Control Structure .....	37
Antelope Coulee Cutoff .....	39
ENGINEERING SERVICES .....	40
Design Division .....	40
Drafting Section.....	41
Air Photo Analysis and Engineering Geology Division .....	42
Soil Mechanics and Materials Division.....	43
Drainage Division .....	45
Hydrology Division .....	47
CONSTRUCTION, EQUIPMENT and SUPPLY DIVISION .....	48
PLANNING and INFORMATION DIVISION .....	49
Information and Publicity Section .....	49
Photo Section .....	49
APPENDICES .....	50
Appendix I	
Water Development Program – Progress by years in the Con- struction of Individual, Neighbor and Community Projects.....	50
Appendix II	
Water Development Program – Number of Individual, Neighbor, Community and Large Water Development Projects and amount of financial assistance paid from April 1, 1960 to March 31, 1961 .....	51
Appendix III	
Water Development Program – Number of Individual, Neighbor, Community and Large Water Development Projects and amount of financial assistance paid from April 1, 1935 to March 31, 1961 .....	52
Appendix IV	
Community Water Storage and Irrigation Projects to March 31, 1961 .....	53



# TABLE OF CONTENTS (continued)

	Page
APPENDICES (continued)	
Appendix V	
Cumulative Statement – Development and Operation of Community Pastures under the P.F.R.A. – 1938 to March 31, 1961 .....	70
Appendix VI	
P.F.R.A. Community Pastures in Operation During the Fiscal Year ended March 31, 1961 .....	71
Appendix VII	
Major Projects – Irrigation, Reclamation and Water Storage administered by P.F.R.A. to March 31, 1961 .....	74
Appendix VIII	
Prairie Farm Rehabilitation Act – Expenditures by Activities April 1, 1935 to March 31, 1961.....	76

# PLANS

## Plate Number

Small Water Projects .....	I
Community Pastures .....	II
Bow River Project – Resettlement-Hays Irrigation District .....	III
General Plan – St. Mary Irrigation Project .....	IV
General Plan – Bow River Project .....	V
South Saskatchewan River Project .....	VI
Sask. River Reclamation Project .....	VII
Assiniboine River Project .....	VIII
P.F.R.A. Annual Expenditure .....	IX



## INTRODUCTION

The Government of Canada passed the Prairie Farm Rehabilitation Act in 1935 to provide for the rehabilitation of the drouth and soil drifting areas in Manitoba, Alberta and Saskatchewan. Since then many policies and programs have been undertaken to overcome such conditions. In essence, however, they have all had as their primary aim, better utilization of land and water resources in the region, as a means of providing greater security and stability to prairie agriculture.

Much progress has been made and much valuable knowledge and experience has been gained on which to base future long-range land and water conservation planning in Canada. This has involved establishment of improved systems of land use and farming practice more in keeping with soil and climatic conditions prevailing in the region, the development of more assured farm and community water supplies for stockwatering, irrigation and domestic purposes, and the resettlement of farmers from lands unsuitable for cereal crop production, to irrigation projects and to better dry-land farming areas where they might be assured of deriving an adequate standard of living from farming.

The following report deals primarily with P.F.R.A. activities during 1960, but it does also, in a general way, review P.F.R.A. progress in its various undertakings since 1935.



The Motherwell Building in Regina, headquarters of the  
Prairie Farm Rehabilitation Administration.

Ref. No. 10373



## ADMINISTRATION and ORGANIZATION

The Prairie Farm Rehabilitation Act is administered by a Director who is responsible to the Deputy Minister of Agriculture in Ottawa. The Director's office is located at Regina, Saskatchewan, where headquarters for the administration has been established. In addition to the Director's office, the organization at Regina consists of the Engineering Services Branch, the Agricultural Services Branch and Administration. The Director's office co-ordinates the activities of the different phases of work with operations conducted through regional, district and special project offices in the field.

The Engineering Services Branch, composed of the following Divisions – Air Photo Analysis and Engineering Geology, Soil Mechanics, Hydrology, Design, Surveys and Drainage, performs the engineering services required by the organization relating to the investigation, design and construction of all projects undertaken by P.F.R.A. Field engineering services are handled by the branch through three regional offices located at Regina, Calgary and Winnipeg.

The Agricultural Services Branch is responsible for all activities associated with the development of farm and community water storage and irrigation projects, and the development and operation of Community Pastures. District offices of the branch are located at Brandon in Manitoba, Weyburn, Gravelbourg, Melville, Saskatoon, Biggar, Swift Current and Maple Creek in Saskatchewan, and Medicine Hat, Fort Macleod, Wainwright and Hanna in Alberta. P.F.R.A. operates special project offices at Vauxhall and Lethbridge in Alberta, Cutbank in Saskatchewan, and Dauphin and The Pas in Manitoba, to handle the administration and supervision of work on major projects.





## WATER DEVELOPMENT PROGRAM

Over the larger part of the Canadian Prairies, rainfall is generally insufficient to maintain naturally occurring bodies of water, springs, and shallow wells. The conservation of surface runoff water to supplement this supply, therefore, is of primary importance. In recognition of this fact, the Government of Canada has, since 1935, sponsored a program of assistance under authority of the Prairie Farm Rehabilitation Act, to encourage conservation of this type, particularly as it will benefit agriculture.



Dugout provides water supply for garden irrigation and home use on well kept farm south of Regina.

Ref. No. 22375

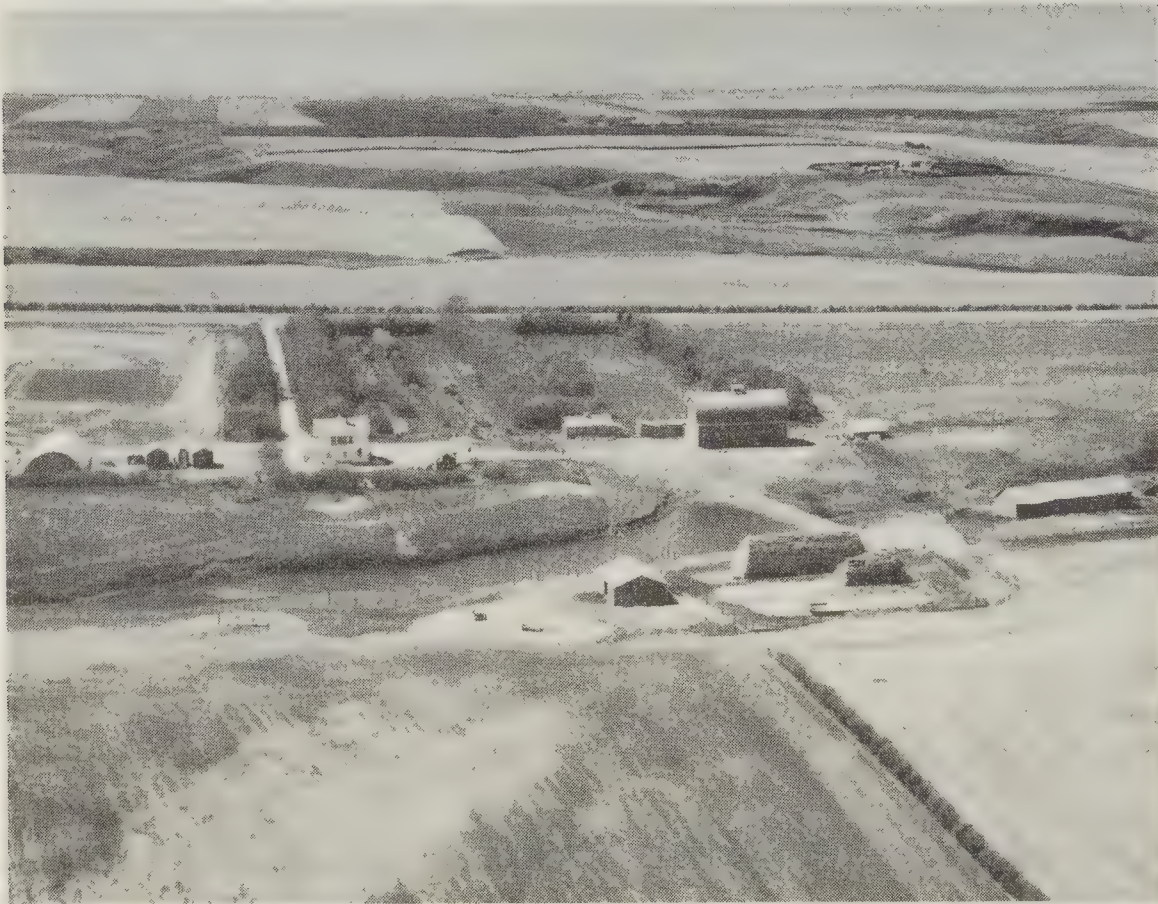
This is a broad program including the development of individual farm-sized water storage and irrigation structures, larger community projects, and large-scale water storage and irrigation works established on the more well-defined watersheds, depending upon the availability of water supply, number of people benefiting, and cost of construction.



## Farm and Community Projects

Farm projects generally take the form of a small dam or dugout built to serve a farm or neighboring farms. The principle is to help farmers help themselves, with P. F. R. A. supplying all agricultural and engineering services required, and approximately 50 per cent of the cost of construction.

Due to late season drouth conditions, a very heavy demand resulted for this type of project in 1960 bringing the total number of farm projects constructed during the 1960-61 fiscal year to 5,236 as compared with 4,327 projects the year previous. These included 4,577 dugouts, 491 stockwatering dams and 168 irrigation projects. Financial assistance received on these projects by farmers averaged \$206.12 on dugouts, \$153.39 on stockwatering dams and \$390.85 on irrigation projects, as compared with the long-term average assistance on such projects of \$121.55, \$93.44 and \$243.96. This increase reflects a general trend toward the construction of larger projects and an increase in the rate of financial assistance the Government of Canada now pays to farmers on the construction of such projects. The increase came into effect April 1, 1959.



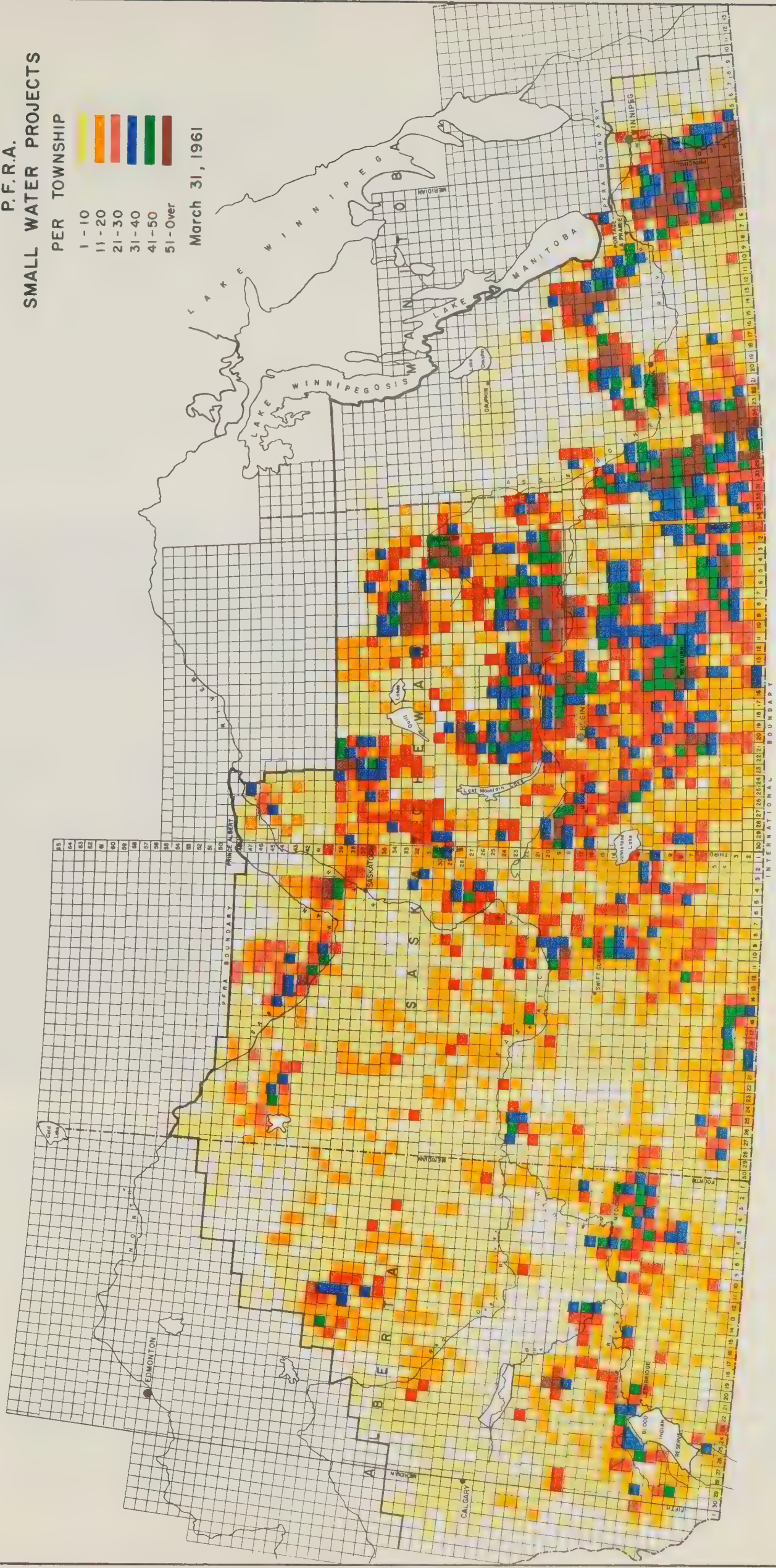
Stockwatering dam brings assured supply of water to this picturesque farm.



# P.F.R.A. SMALL WATER PROJECTS



March 31, 1961







Financial assistance currently being paid on individual farm water development projects is calculated on a basis of 7¢ per cubic yard of earth moved, and 25 cents per cubic yard for rock and building materials used in construction, up to a maximum of \$250 for dugouts, \$300 for dams, and \$600 for the development of small irrigation schemes. Where two neighboring farmers wish to pool their water resources by co-operating on the construction of a larger reservoir, the amount can be raised to a maximum of \$1,000.

Community projects serve groups of farmers. On this construction, P. F. R. A. again supplies all engineering services required and generally assumes the larger share of the construction costs. Due to the open fall



The Brown Hill Dam is a community project providing numerous farmers with an assured water supply.

Ref. No. 19081

and winter during 1960-61, it was possible to complete virtually all construction planned for the year, resulting in one of the largest construction years for community projects on record. Included were 45 projects, 8 of which were started in 1959 and completed in 1960, and 37 which were started in 1960.

## Large Water Development Projects

Large water conservation projects are undertaken by agreement between the Federal Government and provincial or local government concerned, in areas where there is a special need. During the year five of these projects were completed. A brief description of each of these is presented below.

### Neepawa Storage Project

The Neepawa Dam is situated on the Whitemud River east of the town of Neepawa, Manitoba. This is a 30 foot high, earth structure extending across the valley of the Whitemud River for a distance of 1,800 feet, with a reinforced concrete chute-type spillway of 9,800 c. f. s. maximum discharge capacity. The reservoir capacity is approximately 4,000 acre feet of water, sufficient to balance the flow in the Whitemud River and in so doing, provide a dependable source of water for the livestock population in adjacent areas. It will also provide a dependable supply of water for domestic use in rural and urban centers in surrounding districts.

Construction of the dam was commenced in May 1959 and completed early in 1960.

### Souris-Oxbow Weir

Situated on the Souris River in the extreme southeastern corner of Saskatchewan, this new structure replaced a rock and timber weir built by P. F. R. A. in 1938. The new dam, like the old structure, is basically of rock and timber construction 175 feet long and 23 feet in height.

Construction began in October 1960 and was completed in March 1961. The reservoir will store approximately 340 acre feet of water, which will be utilized for stockwatering, irrigation and recreation.

### Cabri Dam

This dam is located on Antelope Creek, approximately one mile from the town of Cabri, Sask. Work on this project consisted of the renovation and improvement of an older structure constructed by P. F. R. A. Due to serious deterioration of the concrete in the spillway and danger of failure, the riparian outlet was removed and a combined drop inlet and riparian structure was built. The old spillway was dyked off and will be used only in an emergency. The work was carried out during the 1960 summer period.





The newly constructed Altawan Dam spillway in southwestern Saskatchewan.

Ref. No. 21934-1

### Altawan Dam

This dam is on Lodge Creek about seven miles southwest of Govenlock, in the extreme southwestern part of Saskatchewan. Located as it is in one of the driest rangeland areas of Western Canada, the project will play a major role in providing an assured water supply for stockwatering, irrigation and streamflow maintenance.

Construction was started in 1959 and completed during the summer of 1960. The dam is approximately 55 feet in height and 1,200 feet wide, possessing both a reinforced concrete spillway and an emergency spillway. The reservoir will hold 5,830 acre feet of water.



Associated with the project is a new concrete diversion weir constructed in 1960. This is located immediately below the dam and controls the supply of water to the Spangler Irrigation Project.



A diversion weir on the Spangler Irrigation Project below the Altawan Dam.

Ref. No. 21464-2

### Rivers Water Storage Project

The Rivers Dam on the Minnedosa River, is about one mile northeast of the town of Rivers, Man. It will create a reservoir capable of providing a reliable supply of water for livestock throughout the areas associated with the project, and of sufficient size to make plentiful supplies of water available for domestic use in surrounding communities. The Rivers Project will also assist in maintaining the stream flow in both the Minnedosa and Assiniboine rivers.

Construction began in June 1958 and continued through 1959 and into 1960. Work undertaken during the current fiscal year involved completion of the uppermost 15 feet of embankment, placing of rock protection on the upstream face of the dam, and general cleaning up operations.



## Technical Assistance

In addition to financial assistance provided for "farm" and "community" projects, the following free field services were supplied by the Water Development Branch during 1960-61:

### Agricultural Services      Engineering Services

#### Dugouts

Preliminary Calls	1,631
Final Inspections	3,955
Miscellaneous Inspections	936

#### Stockwatering Dams

Preliminary Calls	387	
Final Inspections	176	422
Miscellaneous Inspections	166	951
Surveys Completed		507
Plans Prepared		433

#### Irrigation

Preliminary Calls	398	
Final Inspections	89	172
Miscellaneous Inspections	205	830
Surveys Completed		396
Plans Prepared		256

#### Community Projects

Preliminary Calls	136	
Final Inspections	40	
Miscellaneous Inspections	172	
Projects Investigated		191
Projects Built		41
Surveys and Plans Prepared		32
Maintenance		56

	<hr style="width: 50%; margin: 0 auto;"/>	<hr style="width: 50%; margin: 0 auto;"/>
Sub Totals	8,291	4,287

	<hr style="width: 50%; margin: 0 auto;"/>	<hr style="width: 50%; margin: 0 auto;"/>
TOTAL		12,578

## COMMUNITY PASTURE PROGRAM

P. F. R. A. community pastures in Saskatchewan and Manitoba are located on lands not suited for the growing of grain crops. Some of the pasture land is owned but the majority is leased to the Government of Canada by agreement with the provinces. The Federal Government agrees to construct, operate, maintain and improve community pasture facilities in the areas designated by these provinces.



A dam in Caledonia Community Pasture creates a reservoir for stockwatering.

Ref. No. 22068

Since 1937, sixty-eight pastures, enclosing an area of 1,933,834 acres have been constructed by P. F. R. A. , including the Bitter Lake Irrigation and Bull Development Station. This area is divided into five Supervisory Territories with headquarters at Brandon, Weyburn, Swift Current, Kindersley and Saskatoon. During the year 6,362 patrons pastured 121,263 cattle, 1,096 horses and 2,250 sheep.



## Pasture Operations

The 1960 grazing season extended from the first week in May to the end of October except in Val Marie Pasture #1 and Bitter Lake Pasture where special arrangements were made to graze a limited number of cattle to the end of December at the regular rates. The 1960 spring runoff, in most cases, filled dams and dugouts thus providing adequate stock water during the grazing season. Grass made good growth following heavy June rains and pastures went into the winter with an adequate carryover of grass except for a few pastures in southwest and west-central Saskatchewan. Applications in excess of carrying capacity totalled over 30,000 cattle and occurred in all but two of the Saskatchewan pastures. This resulted in serious allocation problems for the Advisory Committees. To overcome this, considerable numbers of cattle were trucked long distances from grass-short areas to the Royal and Beaver Hills pastures in Saskatchewan and to several of the Manitoba pastures where surplus pasturage existed.

### Allocation of Pasturage

Pasture Advisory Committees allocate pastures on the basis of need in accordance with established policy. The committee also sets the maximum number of stock per patron which varies according to local conditions. P.F. R.A. annually establishes the carrying capacity of each pasture.

The following is a schedule of pasture fees and service charges in effect during the 1960 season:

### Grazing Rates

Cattle per day per head	.03
Horses per day per head	.04
Sheep per month per head	.10 (provide own herder)
Cows (breeding service)	3.00 per head
Calves of current year, sucking with dam, born before August 1st.	3.00 per head
Colts of current year, sucking with dam, born before August 1st.	4.00 per head

### Minimum grazing fees per head per season

Cattle	3.00
Horses	4.00
Sheep	.30

## Rates for Vaccine and Other Services

Vaccines	.15 per single dose
Dehorning	.50 per head
Warble and Horn Fly Spraying	.15 per head
Mineral Supplement	.35 per head
Castration: Cattle under 6 mos.	1.00 per head
Cattle 6 mos. & over	2.00 per head
Special Vaccines	At Cost



Patrons sort their cattle at Wellington Community Pasture at the end of the grazing season.

Ref. No. 14275

## Haying

During the year, 4,500 tons of hay were harvested on community pastures for the purpose of feeding bulls and headquarters stock. In 16 pastures, 3,500 acres were reseeded to grass - 652 acres to crested wheat grass, 385 acres to brome and crested wheat grass and 2,466 acres to mixed grasses. Brome grass seed harvested totalled 11,600 pounds.

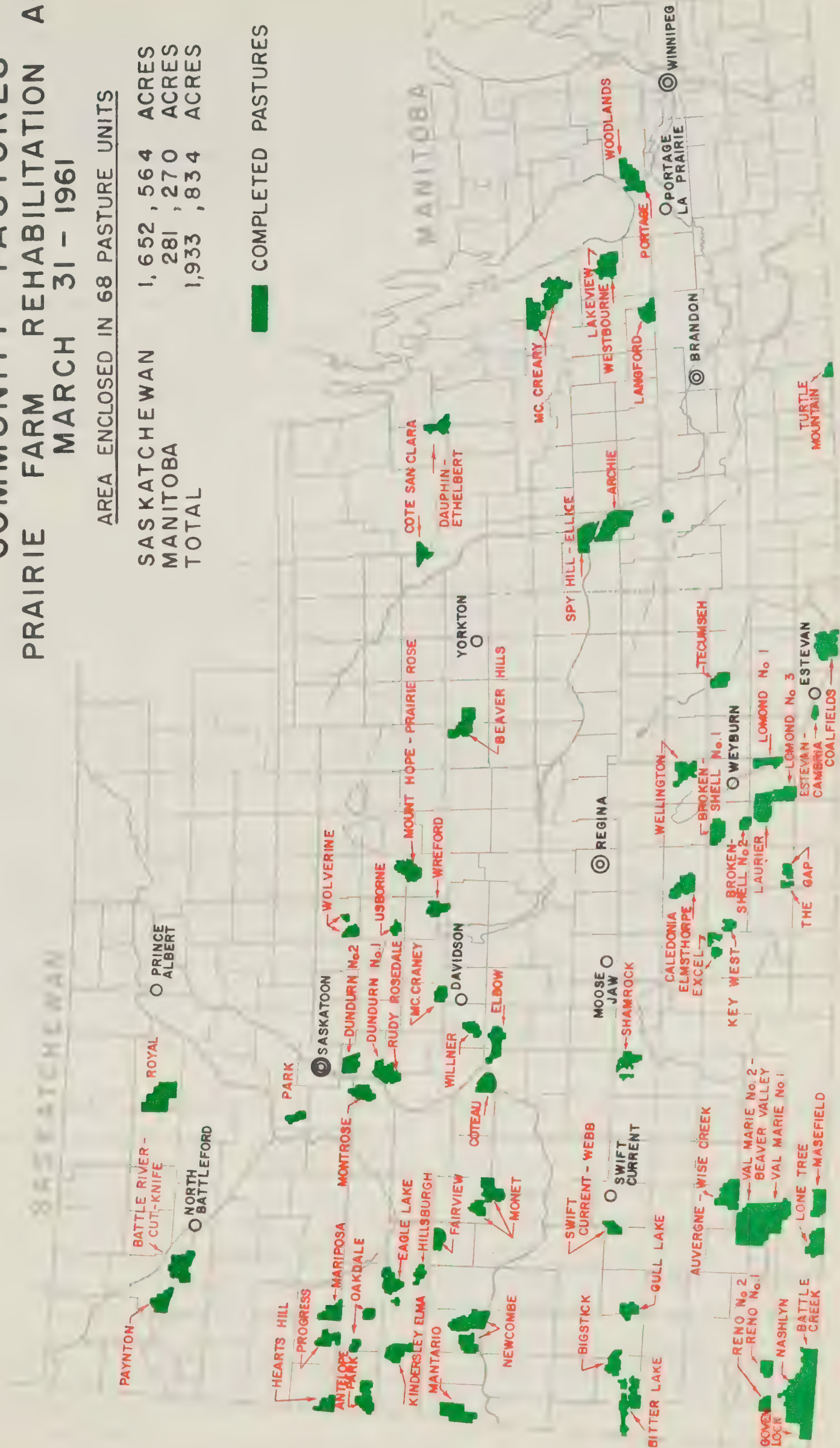


# COMMUNITY PASTURES PRAIRIE FARM REHABILITATION ACT MARCH 31 - 1961

AREA ENCLOSED IN 68 PASTURE UNITS

SASKATCHEWAN	1,652	564	ACRES
MANITOBA	281	270	ACRES
TOTAL	1,933	834	ACRES

COMPLETED PASTURES







## Fires and Fire Protection

Prairie fires caused some damage in pastures during the year. Pastures located in the southwest and north-central areas of Saskatchewan are protected by 800 miles of fireguards constructed and maintained by motorized graders. Power spraying units, located at each pasture, are useful for fire protection.

## New Pastures

A pasture enclosing an area of 71,820 acres east of McCreary, Man., was put into operation in 1960. Although only 750 head were pastured in 1960, this pasture has an estimated carrying capacity of 4,000 head. Two other new Manitoba pastures under construction in 1960 will commence operations in 1961. These are Turtle Mountain, south of Boissevain, with an area of 23,070 acres and Dauphin-Ethelbert, north of Sifton, involving 22,080 acres.

## Breeding Service

Breeding service was provided by 833 bulls owned by P.F.R.A. and 302 bulls rented from pasture patrons. To maintain this service in future years, 244 Hereford, 8 Shorthorn, 12 Aberdeen Angus, and 22 Charolais bulls were purchased. The current charge to a pasture for P.F.R.A. bulls is \$40.00 per bull annually. A majority vote taken at the annual meeting determines the breed of bulls to be used in each pasture. Since this service was started in 1938, 3,165 bulls have been purchased and used. Cows bred in community pasture breeding fields in 1960, numbered 36,000.

The first artificial insemination program on a community pasture was undertaken in 1960 at the Kindersley-Elma pasture. P.F.R.A. supplied the facilities and semen while a local committee of pasture patrons handled all other aspects of the operation. Conception rate with the 384 cows served was quite satisfactory. Plans are being made to use artificial insemination in the Laurier pasture in 1961.

## Livestock Diseases

No serious problems occurred in 1960. Pink-eye and foot-rot, prevalent in many pastures, responded well to treatment. Cattle with warbles were treated before entering pastures. Other sundry services included dehorning, vaccination, branding, castration, and treatment of sick animals as required. An effective program for the control of external parasites including horn flies, mosquitoes, lice and ticks was carried out by spraying and the use of treated back-scratchers. Satisfactory results were obtained through the use of a new product, Co-Ral, for the control of warbles and lice. A number of pastures engaged a veterinarian to vaccinate all heifer calves for Brucellosis at the fall roundup. All cattle handled on community pastures are subject to local municipal bylaws and departmental regulations in respect to Brucellosis and Tuberculosis programs.



## Livestock Insurance

Losses included 623 cattle and 6 horses - approximately one half of one per cent of the total livestock handled during the season. These losses were partly covered by insurance. Patrons in 37 pastures carry mutual insurance and insurance reserves at March 1, 1961 totalled \$64,042.74.

## Pasture Construction

During the year seven construction crews enclosed a total area of 47,470 acres, the greater part of which represented the new Turtle Mountain and Dauphin-Ethelbert pastures in Manitoba. Two complete sets of headquarters buildings were erected and 202 miles of new fences built.



A fenced dugout and windmill in Willner Community Pasture.

Ref. No. 17570

Three water development crews carried out an extensive construction and maintenance program on domestic and stockwatering facilities. Eighty-eight maintenance jobs were carried out on existing windmills, pump installations and household pressure systems. Twenty-seven shallow wells were drilled, 28 windmills erected, 99 water troughs installed and 11 windmills dismantled and moved to new locations. Privately owned construction equipment excavated 35 new dugouts, developed 10 springs and drilled 5 new wells.



Summary of Pasture Construction Activities - 1960-61 Season

Particulars	Projects Completed in 1960	Repair work Completed in 1960	Total to March 31, 1961
Fencing (miles)	202	37	4,708
Corrals, No. of	1	5	163
Pasture Managers' Dwellings, No. of	2	1	60
Riders' Cabins, No. of	0	1 (2 dsmltd.)	35
Barns, No. of	2	1	61
Garages, No. of	2	-	61
Bull Sheds, No. of	4	6	58
Other (granaries, oil sheds, chicken coops, pump houses, etc)	10	3	180

Water Development

Windmills, No. of	28	6	431
Wells, No. of	34	61	384
Springs, No. of	11	5	194
Dams, No. of	7	9	278
Dugouts, No. of	68	8	715

Total number of acres enclosed as at March 31, 1960 1,886,364

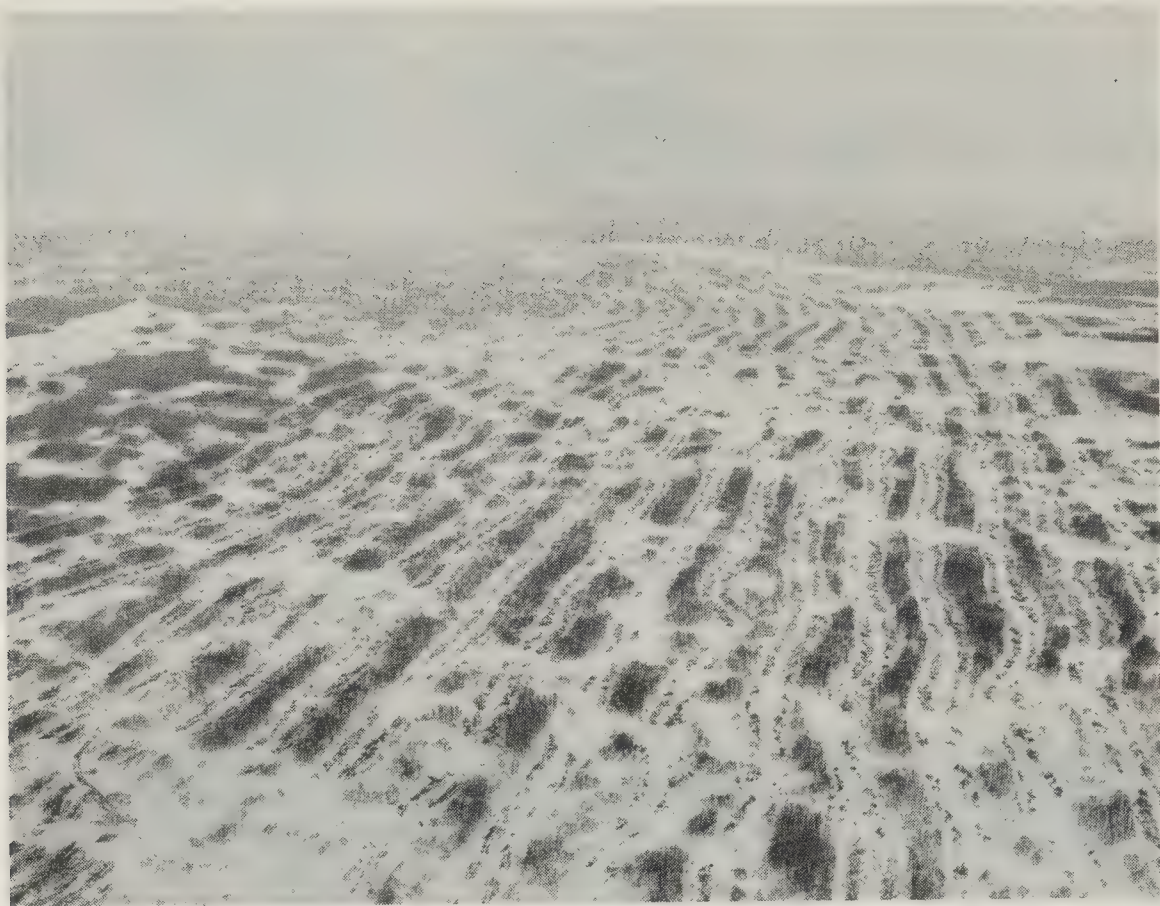
Total number of acres enclosed 1960 construction season 47,470

Total number of acres enclosed as at March 31, 1961 1,933,834

Pasture Improvement

Pasture improvement work during the year was concentrated on the development of areas for flood irrigation, stockwatering construction, grazing surveys, land clearing, brush control operations, and surveys for future development.

Extremely dry weather and below-normal runoff conditions reduced grass production in some areas of spring flood irrigation projects. Projects which could be flooded or irrigated showed excellent germination and good grass production. Such projects included the Bitter Lake Pump-Gravity scheme, the Dry Lake project in Val Marie #2 Pasture, the Dixon Slough project in the Battle Creek Pasture, the Masefield Flood Scheme and all flood schemes in the Beaver Hills Pasture.



Bush clearing operations in Archie Community Pasture using ball and chain method.

Ref. No. 21915-1

A start was made this year in the development of an additional 2,000 acres of pasture for spring flood irrigation. Stockwatering construction recommended, included 8 dams, 15 dugouts and the development of 3 springs. Repairs were made to eroded spillways on 9 dams by the installation of closed conduit spillways. Regrassing was completed on 275 acres and cultivation for regrassing operations was completed on flood irrigation projects covering 2,100 acres. Land clearing by the ball and chain method was completed on 1,500 acres. Spraying with herbicides to control willow and aspen regrowth on cleared pasture land was completed on 4,000 acres.

Range management studies covering extensive grass surveys and surveys for stockwatering requirements and irrigation were conducted in the open plains region during the year.



## REHABILITATION and RESETTLEMENT

The Prairie Farm Rehabilitation Act also provides for the rehabilitation and resettlement of farmers from areas of the prairies where drouth conditions have rendered farming hazardous. Where it has been possible to achieve such rehabilitation without moving farmers, this has been done. In other instances, it has been necessary to physically move farmers from certain areas and to rehabilitate them on land in better dry-land farming areas or on irrigation projects specifically developed for the purpose.

Following is an account of activities centering around the development and operation of irrigation projects in southwestern Saskatchewan and Alberta, built and operated by P. F. R. A. especially for rehabilitation and resettlement purposes.

### Eastend Irrigation Project

This project is located in the Frenchman River Valley and extends for 15 miles southeast of the town of Eastend, Saskatchewan. Irrigation water is supplied from the Eastend Reservoir and in dry periods this storage is supplemented from the Cypress storage reservoir in the Cypress Hills.

The project has a potential irrigable area of approximately 3,300 acres of which 2,740 acres were operated by 50 plot holders in 1960, with 2,640 acres being used to produce forage crops, 70 acres in coarse grain, and 30 acres in summerfallow. Feed production amounted to 3,900 tons, sufficient to meet the requirements of 4,000 cattle and 2,000 sheep owned by the plot holders. There are now 1,560 more acres in forage and 2,500 more cattle than there were in 1953.

Precipitation during the growing season amounted to 4.0 inches or less than 50 per cent of normal. To supplement this the farmers on the project irrigated 995 acres once and 1,715 acres twice. During 1960 the total quantity of water discharged from the reservoir was 6,050 acre feet. Due to the low rainfall it was necessary to draw from Cypress Reservoir to complete the irrigation season.

During the 1960 season, P. F. R. A. reseeded 100 acres of forage on the new area known as the Uglum Extension because soil drifting had damaged the forage seeded in 1959.

As part of the project improvement, three miles of deep surface drains were rebuilt and a 600-foot section of the main canal was lined with a plastic liner. This will eliminate seepage entirely and stabilize this section of the canal which had been sliding into the Frenchman River, when the banks became saturated. Adjacent to this canal, the river was moved over 100 feet

to protect the canal banks from erosion. P. F. R. A. also assisted farmers to level 60 acres of land.

### Consul Irrigation Project

This project is located in the Consul and Nashlyn district, an area with the lowest annual precipitation in Saskatchewan. Farmers who settled in this region found they could not make a living from straight grain farming and eventually had to relinquish their holdings or branch out into livestock production. The region is ideally suited for raising cattle when a reliable source of feed is established. This creates a constant demand for irrigated land in the Consul district.

The Consul projects contain 3,635 acres of land that can be irrigated. Of this, 620 acres in 1960 were still under development. The remaining 3,015 acres were operated by 55 plot holders. Precipitation during the growing season was 4.4 inches as compared with 8 to 10 inches in a normal year. During the season, 2,530 acres of land were irrigated twice and 385 acres received one irrigation. Water is obtained from the Cypress Storage Reservoir. A total of 6,200 acre feet of water were released to the farmers during the irrigation season. Forage production amounted to 5,380 tons, averaging 2.2 tons per acre. This was sufficient to supplement the winter feed requirements of 4,700 cattle and 2,000 sheep. Since 1952 there has been an increase of about 3,500 cattle owned by farmers and ranchers making use of the irrigated land in this area.

On the Richardson-McKinnon section of the Consul project at Nashlyn, 620 acres are under development. This land should be available to the farmers in 1963.

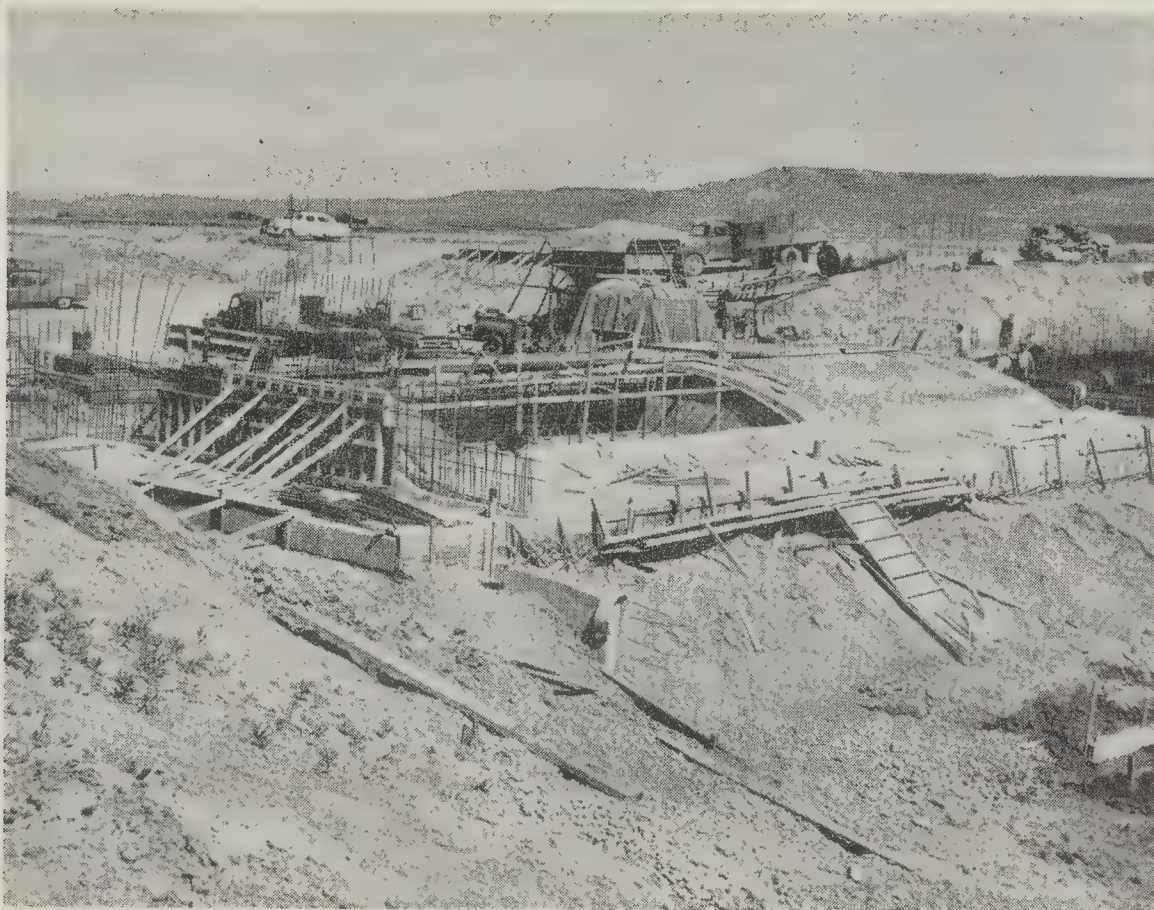
A new reservoir located southwest of Govenlock, Sask., was constructed on Lodge Creek in 1960. It was named 'Altawan Reservoir' and it will supply the Spangler project and a number of flood schemes operated by P. F. R. A. in adjacent community pastures. This reservoir has a capacity of 5,830 acre feet.

P. F. R. A. crews and equipment were kept busy during the year, cleaning and repairing ditches and canals, controlling weeds, repairing irrigation structures and distributing water to individual irrigators.

### West Val Marie Irrigation Project

This project is located in the Frenchman River valley 15 miles northwest of the village of Val Marie. Irrigation water is obtained from the West Val Marie dam which does not have sufficient capacity to supply the project, consequently Cypress Storage Reservoir supplements the water requirements of this area via the Frenchman River.





Construction goes forward on the crest section of spillway for dam on the West Val Marie Irrigation Project.

Ref. No. 18242-2

The project contains approximately 3,500 acres of potentially irrigable land. In 1960, fifty-one farmers operated 2,730 acres of irrigable land, producing 3,650 tons of feed and some coarse grain. The total acreage now in forage amounts to 2,240 acres from which hay was cut. The average yield was 1.5 tons per acre.

During the season farmers irrigated 160 acres three times, 1,300 acres twice, 950 acres once and 120 acres under development were partially irrigated. Precipitation during the growing season was 3.24 inches, 5 to 7 inches less than the long-term average.

The West Val Marie project produced enough hay for 4,000 cattle owned by the plot holders. In addition to the feed produced, 1,200 cattle are being fed and winter grazed on the project.

Considerable development and maintenance work was carried out in 1960. The old spillway at the reservoir was demolished and a new compacted earth fill and concrete spillway was constructed in its place. The main dam was raised four feet and new riprap placed. The completion of this work has



doubled the capacity of the West Val Marie Reservoir and this project will not be so dependant on Cypress Reservoir for its supply of water in the future. Other maintenance included repairing irrigation structures and canals supplying water to individual farmers on the project.

### Val Marie Irrigation Project

This project is located in the Frenchman River Valley near Val Marie in southwestern Saskatchewan. Water is obtained from runoff on the southern slopes of the Cypress Hills and stored in a 12,000 acre foot reservoir. This is sufficient water to supply the project for one season.

The project now has a total irrigable area of 4,680 acres. In 1960, seventy-five farmers irrigated 4,320 acres producing 6,300 tons of forage and 600 tons of green oats. The average yield increased from 1.4 tons per acre in 1959 to 1.75 tons in 1960. There was sufficient feed to carry 6,500 cattle owned by the plot operators.

During 1960 farmers on the project irrigated 645 acres once, 3,100 acres twice, and 575 acres three times. Approximately 6,600 acre feet of water were discharged from the reservoir during the irrigation season and only 3.2 inches of precipitation were recorded during that time as compared with the long-term precipitation average for this district, of 8 to 10 inches.

Maintenance work in 1960 included the installation of new check and turnout structures on both the main and lateral canals. Two bridges were installed over lateral ditches and 360 feet of pipe in various sizes were used to replace wood culverts. All the lateral ditches in the north and center blocks were cleaned during the season. As part of the project improvement program, 75 acres were scraper levelled and 120 acres were prepared for leveling in 1961.

### Swift Current Irrigation Project

This project is located east of the city of Swift Current. It contains approximately 20,000 acres of irrigable land, of which some 14,500 acres have been, or are undergoing development in the irrigation districts of Swift Current, Waldeck, Herbert and Rush Lake. The first three districts are supplied with water by P. F. R. A., but are operated by private individuals, the Research Station, or the Provincial Conservation and Development Branch. The Rush Lake district, which is divided into two areas, north Rush Lake and south Rush Lake, is operated by P. F. R. A. Water for the whole project is supplied from Duncairn Reservoir southwest of Swift Current and the High-field Reservoir near Rush Lake.



In the north Rush Lake area, 4,700 acres of developed irrigable land operated by 155 farmers, produced 7,000 tons of feed and 11,600 bushels of coarse grain. The average forage yield was 1.95 tons per acre. The feed produced was sufficient to carry 5,760 cattle and 335 sheep through the winter. To supplement the 7.98 inches of precipitation, the farmers on north Rush Lake irrigated 3,550 acres once and 1,430 acres twice.

The south Rush Lake project contains approximately 1,700 acres of land which are irrigated by spring flood from the main drain. In the spring 1,550 acres were flooded. During the season 51 farmers produced 2,280 tons of feed and 6,000 bushels of coarse grain. This was sufficient feed for 1,825 cattle. Total acreage seeded to forage since 1956 now amounts to 1,400 acres.

Improvement work on the north Rush Lake project in 1960 consisted of seeding 565 acres of land to forage. Drainage was improved by the construction of 10 miles of deep drain ditches and 4 1/2 miles of small field drains. New structures, bridges and culverts were installed to replace structures that had been in use for 15 years. Additional structures were installed and a dyke constructed on south Rush Lake to improve and increase the flooded area.

### Maple Creek Irrigation Project

P. F. R. A. has constructed reservoirs in the north slope of the Cypress Watershed with a total storage of 26,000 acre feet of water. This supplies water to irrigate some 10,000 acres of land in the Maple Creek district.

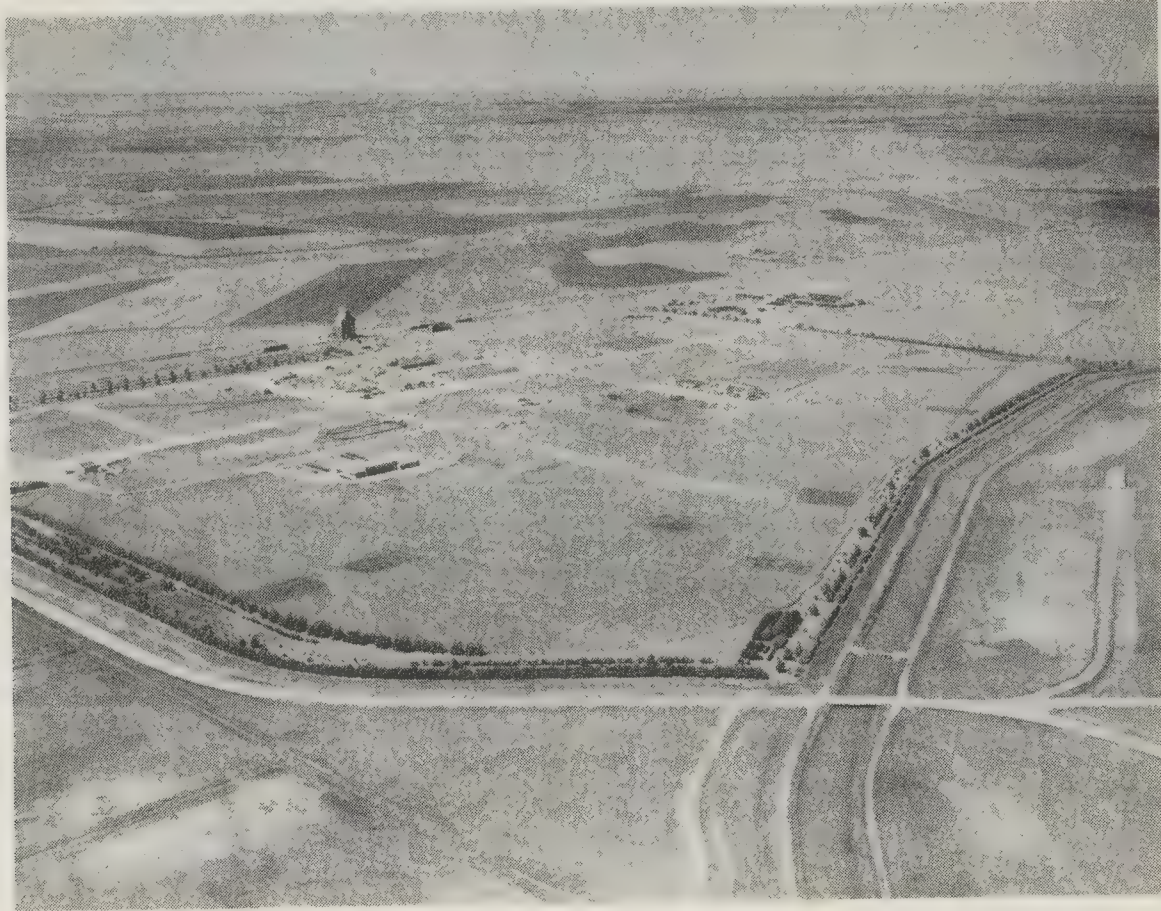
The light snow cover in 1960 in the Maple Creek area produced a low spring runoff. There was sufficient water, however, to irrigate 2,520 acres of land once and 3,850 acres twice. Due to the short duration of runoff, some 4,000 acres of privately owned flood land did not receive a proper irrigation. During the year, 140 farmers and ranchers produced 12,500 tons of forage and 16,000 bushels of coarse grain on the project areas. Production on land that was not levelled averaged one ton per acre but increased to over three tons on irrigated land that had been improved by scraper leveling. This production was sufficient for the winter feed requirements for 13,000 cattle and 1,000 sheep owned by the plot holders.

Development on the Maple Creek project has included the scraper leveling of 1,300 acres of irrigable land in the last five years with 300 acres levelled in 1960. This land leveling has improved the efficiency of irrigation, provided better drainage and increased the yields of forage crops.

A program of maintenance was carried out on the project during the season. A small crew employed at Maple Creek operated the deep well



pumps at the Lower 'V' and distributed water to all the individual farmers on the project. Several large checks, drop structures and bridges were replaced using pressure-treated material. One hundred and sixty small turnouts and 40 small check structures were also constructed.



Community of Hays, Alberta with the main irrigation canal at right, and irrigation patterns in background.

Ref. No. 18020

### Bow River Resettlement Project

During the current year no land was offered to new settlers. Instead, under a new program to increase the size of holdings, available parcels were developed for irrigation, and allocated to existing farms as extensions to their present holdings on a crop share basis. In addition, farmers in certain instances were moved from original holdings to larger, more suitable acreages of irrigable land. As a result, 53 farmers were allocated additional land in 1960 and further adjustments are under study. At the same time, three of the original settlers left the Hays area.

The policy of the Government of Canada to offer special loans to new settlers in the Hays district for housing, fencing, and the purchase of live-stock, also remained in force during 1960. Under this program individual







# BOW RIVER PROJECT

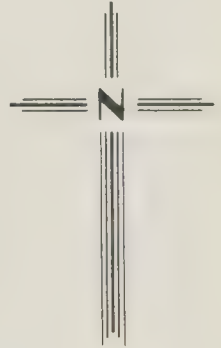
## RESETTLEMENT-HAYS IRRIGATION DISTRICT

MARCH 31, 1961

### LEGEND

-  CANAL
-  ROAD
-  LOT BOUNDARY
-  DISTRICT BOUNDARY

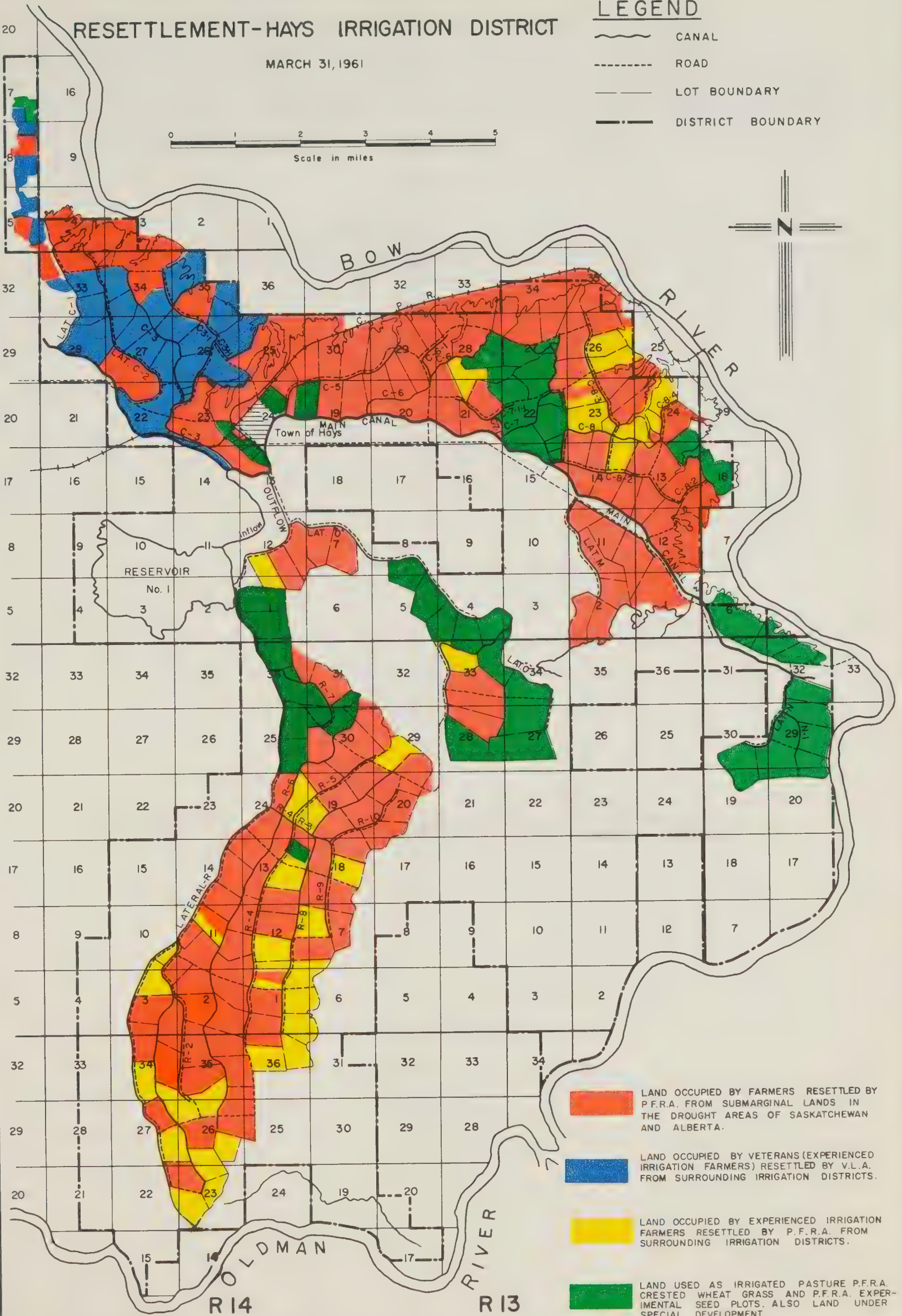
0 1 2 3 4 5  
Scale in miles







T 14

T 13

T 12



-  LAND OCCUPIED BY FARMERS RESETTLED BY P.F.R.A. FROM SUBMARGINAL LANDS IN THE DROUGHT AREAS OF SASKATCHEWAN AND ALBERTA.
-  LAND OCCUPIED BY VETERANS (EXPERIENCED IRRIGATION FARMERS) RESETTLED BY V.L.A. FROM SURROUNDING IRRIGATION DISTRICTS.
-  LAND OCCUPIED BY EXPERIENCED IRRIGATION FARMERS RESETTLED BY P.F.R.A. FROM SURROUNDING IRRIGATION DISTRICTS.
-  LAND USED AS IRRIGATED PASTURE P.F.R.A. CRESTED WHEAT GRASS AND P.F.R.A. EXPERIMENTAL SEED PLOTS. ALSO LAND UNDER SPECIAL DEVELOPMENT





loans of \$2,000 for material to construct dwellings, \$1,000 to assist in the purchase of breeding stock, and \$750.00 for fencing material, were made available to assist in the speedy re-establishment and rehabilitation of new settlers. A summary of loans made under this program to the end of the year is as follows:

Housing:	49 loans approved. . . . .	\$88,500.00
	Expenditure to December 31/60 . . . . .	68,209.58
Fencing:	36 loans approved. . . . .	19,174.59
	Expenditure to December 31/60. . . . .	9,014.88
Livestock:	34 loans approved. . . . .	33,300.00
	Expenditure to December 31/60. . . . .	23,563.17

## MAJOR IRRIGATION and RECLAMATION PROJECTS

Increasing attention has been given in recent years, to the construction of large-scale irrigation and reclamation projects. Financial provision for such projects is not included under regular P. F. R. A. appropriation and must be authorized by special vote of Parliament.

### St. Mary Irrigation Project

Plans for the St. Mary Irrigation Project call for the diversion of the St. Mary, the Belly and the Waterton rivers to irrigate nearly 500,000 acres in southern Alberta. It is a joint effort between the Government of Canada, the Government of Alberta, and the farmers in the area.

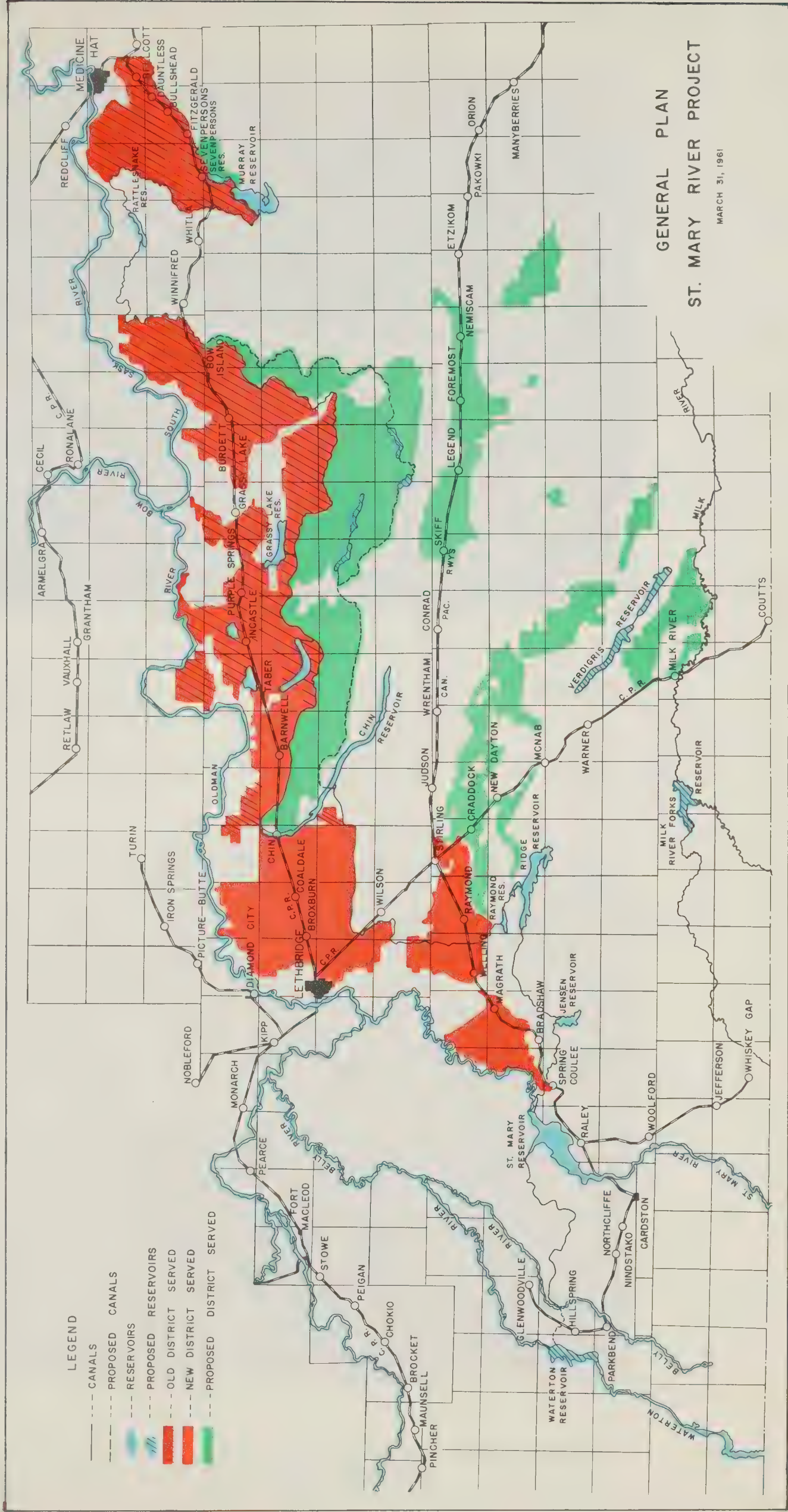
Under an agreement with Alberta, Canada carries out the engineering and supervision of construction for the entire project and assume continuous responsibility for the operation and maintenance of the main reservoirs and connecting canals, charging the province for this service. Canada is also responsible for financing the main works, while Alberta finances the construction of the distributary system, collecting from the farmers an amount equal to ten dollars per irrigable acre.

All the main works are in operation except the Waterton Diversion, now under construction. Distribution works are in operation to serve 304,000 acres. Capital funds expended by the two governments to March 31, 1961 are approximately:

Government of Canada (P. F. R. A. )	\$22,860,000. 00
Government of Alberta	18,814,000. 00

Included in the above expenditure by Canada is approximately \$2,200,000. 00 on engineering and supervision of the provincially financed portion of the project.











The key structure on the vast St. Mary Irrigation Project is the St. Mary Dam.

Ref. No. 22379



The river diversion tunnel outlet at the site of the Waterton Dam, a part of the St. Mary Irrigation Project.

Ref. No. 21944

## Engineering Activities

Surveys, investigation and planning work continued in connection with proposed distribution systems remaining to be built. The construction of the Diversion Tunnel at the Waterton Dam was completed during the year, and a start made on the earthwork contract which was awarded in November.

## Project Improvement

This involves minor capital expenditures on works in operation. In 1960 this work was confined to seepage control ditches along the main canal, as well as improvements to the access walk-way in the St. Mary Dam Diversion Tunnel. A permanent fireproof machine shop was constructed at the St. Mary maintenance camp.

## Operation and Maintenance

Delivery of water from the St. Mary Reservoir totalled 355,000 acre feet in 1960, an increase of about 45 per cent over the previous year. Approximately 75,000 acres were irrigated in the new areas, representing an increase of 39 per cent over 1959.

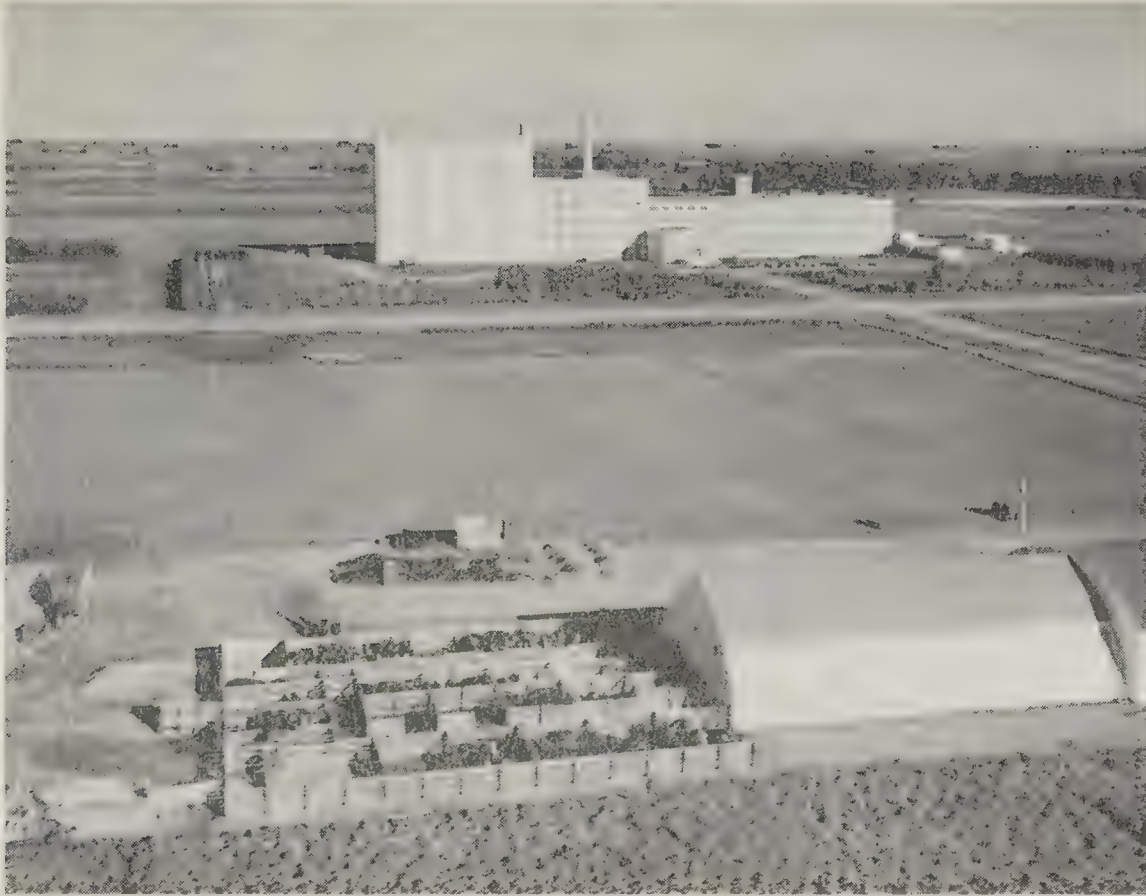
River runoff was slightly below normal, and with relatively high demand for water, the storage on the project was depleted by about 140,000 acre feet. Consequently the Belly Canal was operated all winter in 1960-61.

## Agricultural Development

Specialized crop production was up 10 to 15 per cent over 1959 in the Lethbridge area. Sugar beet acreage was up over 18 per cent and a new beet receiving station was opened at Burdett. This station received beets grown exclusively in the new irrigated areas, and is indicative of progress being made in development.

Plans were announced in January 1961 for the construction of a million dollar plant to process dehydrated potatoes. The plant will be located somewhere near the center of the St. Mary Irrigation Project, and will have an initial capacity of 25,000 tons per year.





Stockyards and sugar refinery established at Taber on the St. Mary Irrigation Project.

Ref. No. 13946



A fine potato crop on the Bow River Irrigation Project near Vauxhall, Alberta.

Ref. No. 16054

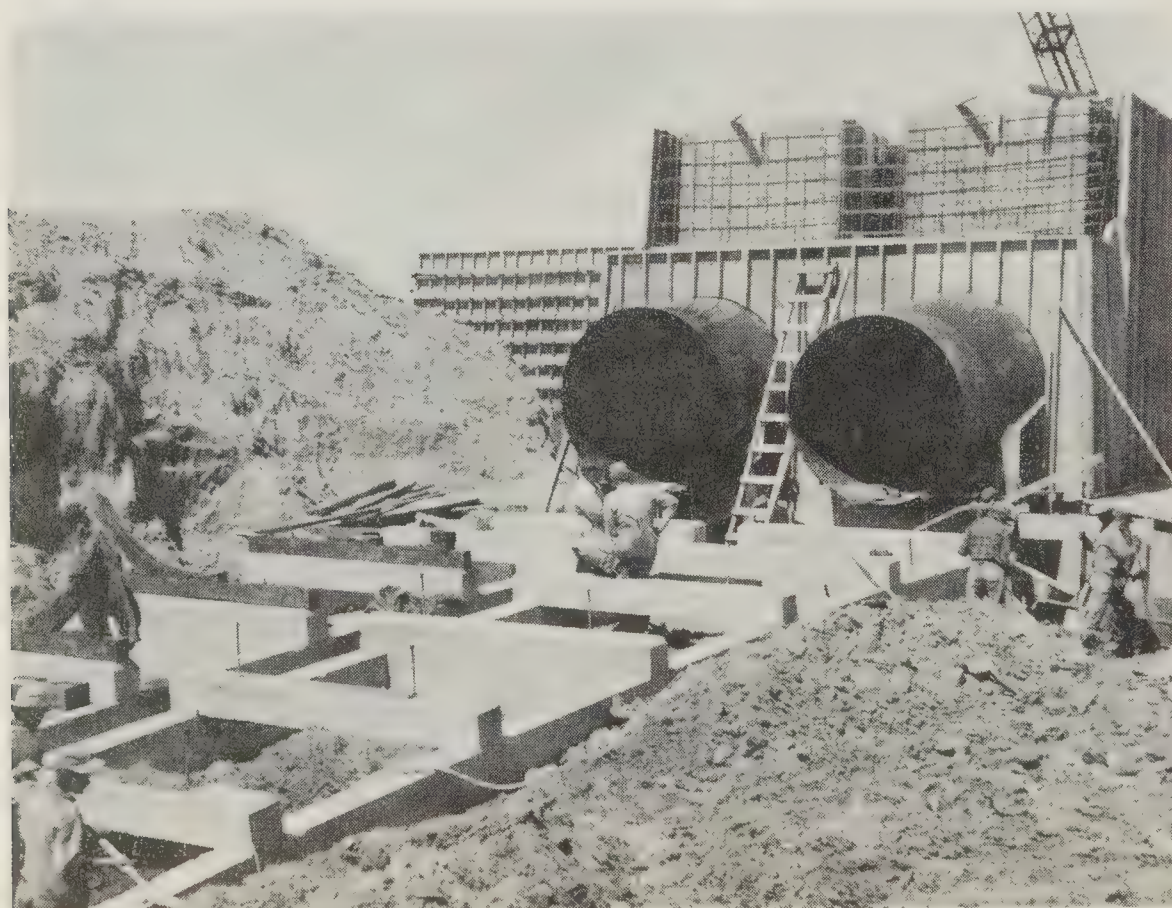


## Bow River Irrigation Project

This project covers an area of 240,000 acres considered irrigable. The breakdown of this acreage is as follows:

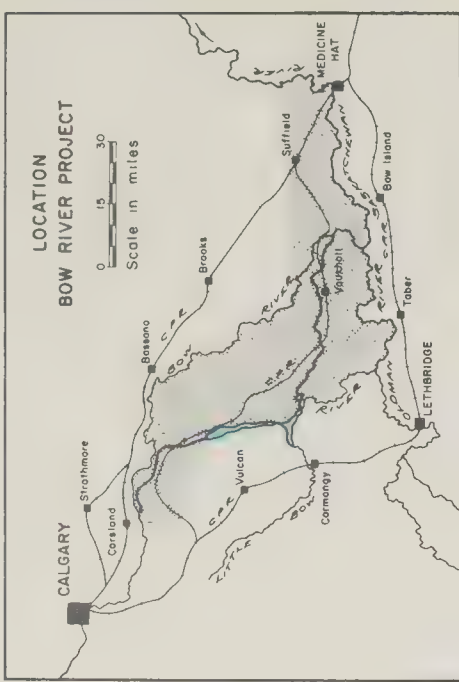
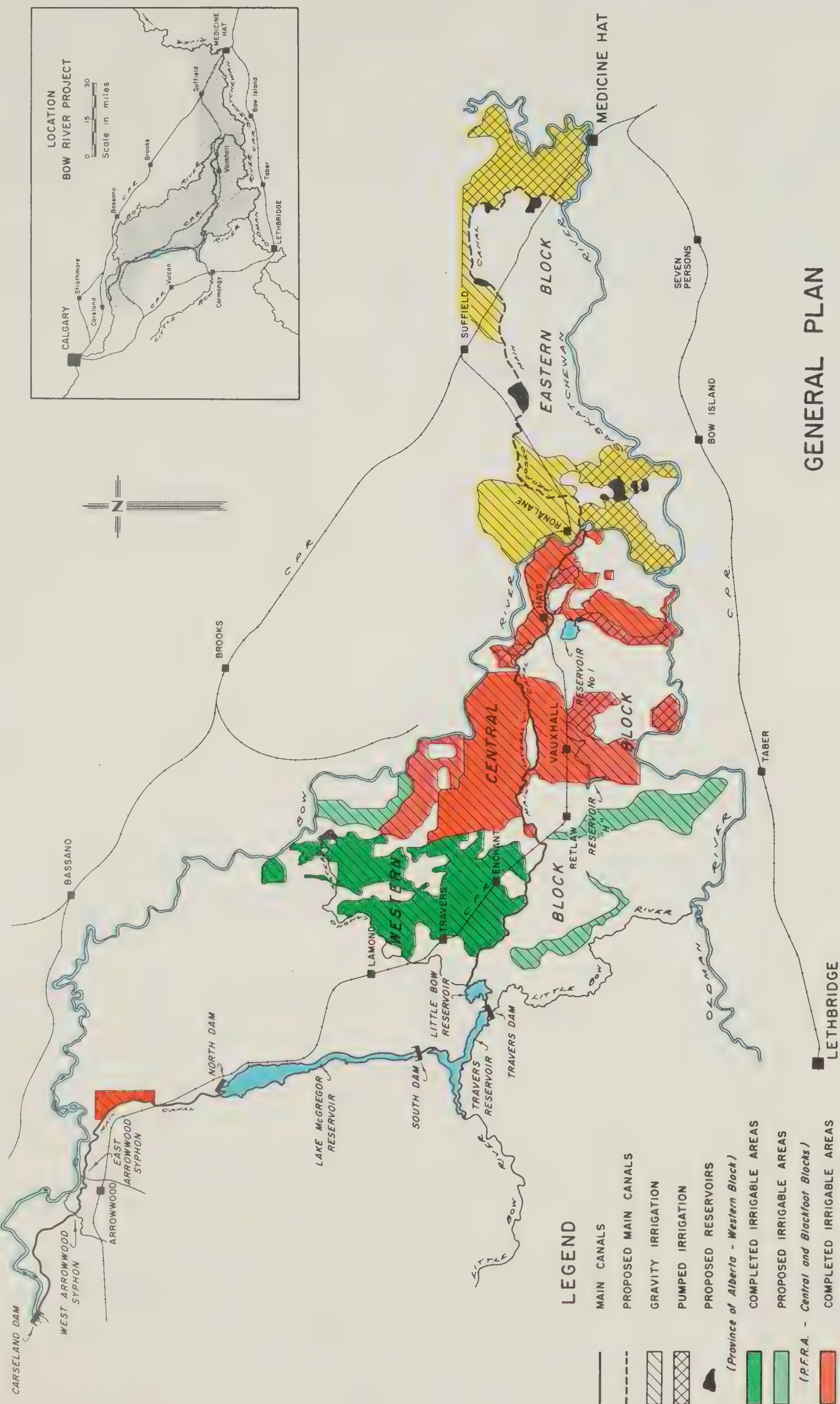
West Block	25,000 acres
Central Block -	
Vauxhall	63,000 acres
Hays	27,000 acres
East Block	120,100 acres
Blackfoot Indian Irrigation District	<u>4,900 acres</u>
 TOTAL irrigable acreage	 240,000 acres

The presently developed districts are situated between the Bow and Oldman Rivers. These include the western and central parts of the project which have been successfully utilized for irrigation. The East Block, north of the Bow and South Saskatchewan rivers towards Medicine Hat, is controlled by Alberta and has not been brought under the ditch. Canada maintains and operates the main canal and reservoir system from the diversion works on the Bow River near Carseland, eastward to Ronalane. The Bow River Project wholesales water to the Blackfoot Indian Irrigation District, (4,900 acres), and the Alberta Bow River Development (25,000 acres). To provide irrigated land suitable for resettlement, Canada developed 27,000 acres in the Hays area. The Vauxhall district, the oldest and largest subdivision, includes 63,000 acres of irrigable land.



Improvements being made to the West Arrowwood Syphon which delivers water to the Bow River Irrigation Project.





# **LEGEND**

- MAIN CANALS
- PROPOSED MAIN CANALS
- GRAVITY IRRIGATION
- PUMPED IRRIGATION
- PROPOSED RESERVOIRS
- (Province of Alberta - Western Block)
- COMPLETED IRRIGABLE AREAS
- PROPOSED IRRIGABLE AREAS
- (P.F.R.A. - Central and Blackfoot Blocks)
- COMPLETED IRRIGABLE AREAS
- PROPOSED IRRIGABLE AREAS
- (Eastern Block)
- PROPOSED IRRIGABLE AREAS

## **GENERAL PLAN** **BOW RIVER PROJECT**

MARCH 31, 1961







## Construction and Maintenance

For all practical purposes the renovation and extension of the original irrigation works on the Bow River Project is now complete. This includes the reconstruction of the inlet structure to the West Arrowwood Syphon started in the spring of 1960, and the installation of a new turbine in the Little Bow Reservoir outlet to operate the structure's control gates. In addition, the province completed construction of the distribution and drainage system in the West Block with engineering assistance supplied by P. F. R. A.

A minimum of maintenance work was required during the year. A flash flood in March washed out the inlet structure of the West Arrowwood Syphon and a portion of the two syphon pipes. To repair this damage it was necessary to dismantle the damaged pipes, backfill the eroded area, replace the cradles and re-assemble the syphons. Project maintenance crews continued their program to replace wooden structures with more durable counterparts, and cleaning of sections of silted-in canal. The program to control weeds along ditchbanks and road allowances was also continued. Stretches of the canal were dragged with a heavy anchor chain pulled by two tractors, to clear the channel growth of submerged aquatic weeds.

## Agricultural Development

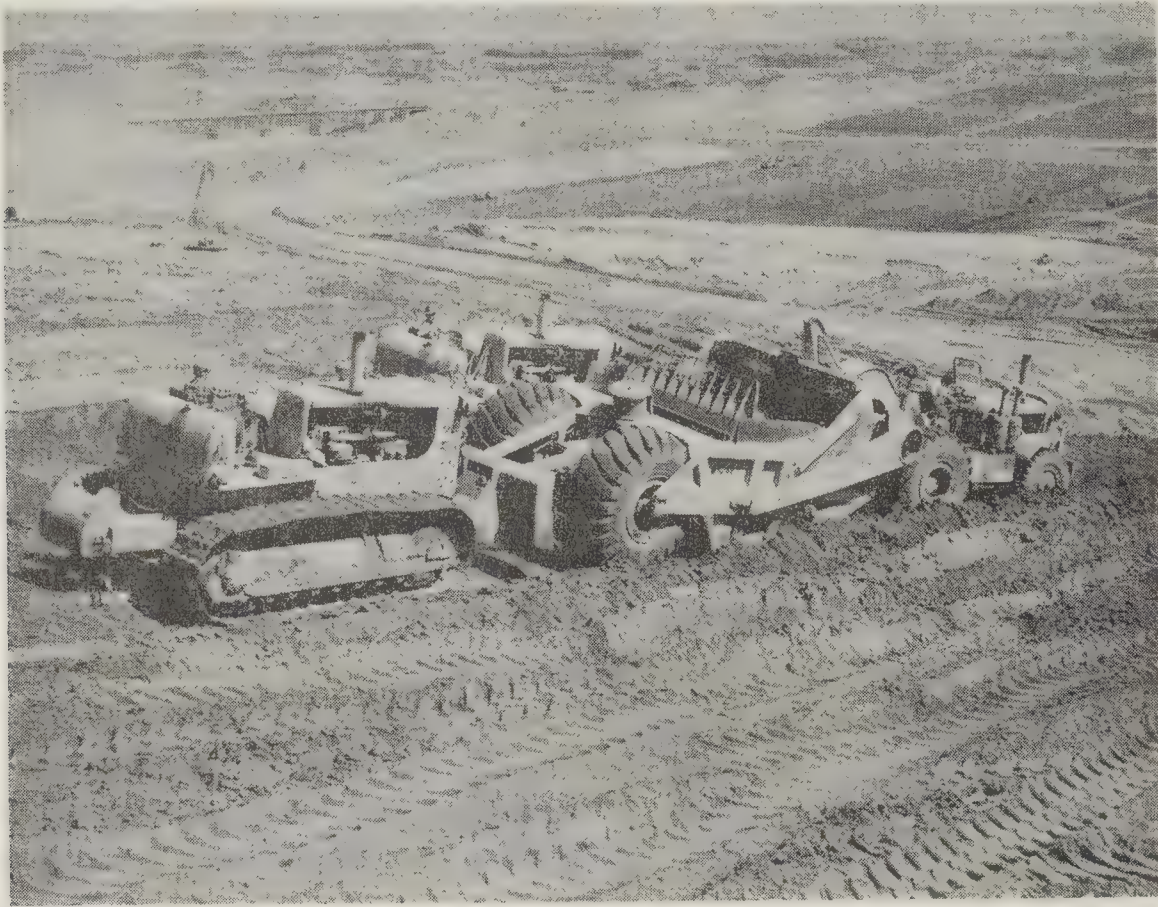
Extremely hot and dry weather during the growing period created a high demand for water and some difficulty was experienced in meeting all requirements. Even where irrigation was timely, the searing heat tended to cause scalding. As a result, some crop deterioration occurred. In addition, hail caused considerable damage. Three hailstorms in the Hays district resulted in a complete loss of crop for 40 farmers, and damage to a lesser extent for many others. In the Vauxhall district two hailstorms occurred affecting 22 farmers and damaged 7,000 acres in crop.

Several new potato growers became established in the Vauxhall district during 1960, and a number of established growers expanded their enterprise. As a result, potato production took a substantial jump during the year with 3,000 acres being devoted to this crop. Livestock production, however, continued to be the major stabilizing influence throughout the project, and with a relaxation of credit restrictions, the number of cattle on feed increased. Hog production, after a sharp reduction in the early months, also showed a gradual increase. During the year, 6,000 fat cattle, 2,800 lambs, and 8,100 hogs were shipped from Vauxhall and Hays.

On the irrigated community pastures established by P. F. R. A. at Vauxhall and Hays, livestock carried in 1960 included 1,401 cattle and 2,000 sheep. The grazing season extended from May 12 to October 6 and 434 tons of hay were cut, baled and stacked at Hays.



On these community pastures a program of gradual pasture improvement is being undertaken. On the Vauxhall pasture 160 acres of pasture were broken and levelled for seeding in 1961. At Hays, 400 acres of land under a proposed pumping scheme were surveyed and fenced in preparation for leveling and breaking in 1961.



Heavy machinery employed on one of the embankment contracts at the South Saskatchewan River Dam.

Ref. No. 20526

### South Saskatchewan River Project

The South Saskatchewan River Dam is the key structure in the long-range plans for the control of the South Saskatchewan River. The reservoir will provide water for hydroelectric power, irrigation, and recreation, as well as for other agricultural and domestic uses. It will also control the flow of the river, minimizing severe fluctuations and making water available for further power developments downstream.





SOUTH SASKATCHEWAN RIVER DAM





## Design and Planning

The preparation of contract plans and specifications, and studies required for other aspects of the project, were continued throughout the year. This work was done by the Engineering Staff of the P. F. R. A.

The preliminary design work on the remaining stages of tunnel construction was also carried on throughout the year, particularly on the control shafts, gates and controls, and the outlet structures. Hydraulic model studies on these latter features were done at the University of Saskatchewan and at St. Anthony Falls Laboratory in Minneapolis, Minnesota, U.S.A.

Studies were continued on the layout and design of the spillway, aided by hydraulic model testing that was also carried out at the two institutions mentioned above.



The mining machine prepares to enter one of the river diversion tunnel portals at the South Sask. River Dam.

Ref. No. 21843

## Construction

Up to March 31, 1961, twenty-three contracts totalling 42.5 million dollars had been awarded by P. F. R. A. Fifteen of the contracts were completed by this date. Total construction expenditure amounts to approximately 16 million dollars.

## Construction Work Force

Construction employment for the year reached a peak of about 650 men in August and September of 1960. In addition, between 200 and 250 people were steadily employed in the construction headquarters area by P.F.R.A., local businesses, and other operations related to the project. It is expected that the construction work force will exceed 1,000 people during the summer of 1962.

## Public Relations

Public interest in both project construction and the operation of the Pre-Development Farm continued at a high level. Thousands of individuals and numerous groups visited the tourist pavilion at Construction Headquarters, and also enjoyed the use of the nearby Provincial picnic grounds.

The tourist pavilion proved to be a feature attraction with its models and displays, coupled with a fine view of construction activities. The pavilion, staffed by three attendants, was open from May through October. In addition, a viewpoint on the west side of the construction area provided visitors with an opportunity to view construction activity in that general area.



Sprinkler irrigation at the Pre-Development Farm being operated in conjunction with the South Sask. River Project.



Visitors to the damsite during the year numbered approximately 82,000. Of these, an estimated 87 per cent were from Saskatchewan, 6 per cent from Manitoba and Alberta, 4 per cent from Ontario and British Columbia, 2 per cent from the United States, and 1 per cent from the remaining Canadian provinces.

### Pre-Development Farm

To provide some information in advance of actual irrigation development, the Pre-Development Farm was established near the town of Outlook by P. F. R. A. in 1949. The primary purpose was to try out standard crops and accepted irrigation practices from other areas to determine their suitability in this area. An experimental area was established adjacent to the farm and is operated by the Research Branch of the Department. The work on each unit is closely co-ordinated and the results of ten years' experience on both units are being incorporated into a bulletin for public distribution.

The following table indicates yields of crops in 1960, a five-year average for each crop, and the irrigation water applied during the 1960 season:

<u>Crop</u>	<u>1960 Yield per acre</u>	<u>Five-year av. /acre</u>	<u>Inches of water applied</u>
Wheat	43 bushels	44.4 bushels	12"
Oats	100 bushels	92.0 bushels	9"
Barley	74 bushels	65.6 bushels	9"
Potatoes	6.5 tons	9.0 tons	12"
Hay	3.3 tons	3.4 tons	12"

The irrigated pasture grazing project started in 1959 was continued in 1960 with 50 grade steers bought in March at an average weight of about 680 pounds. These were dry fed until May 15, after which irrigated pasture was available until September 15. They were then allowed free access to hay and silage and the grain ration was increased so that top prices were obtained for nearly all the steers when sold between October 25 and November 15.

The whole operation returned a profit after paying for related costs including the value of 43 tons of hay and 32 tons of grain produced on the farm. The gain in weight which is credited to the irrigated pasture was about 580 pounds of beef per acre or an average of 547 pounds per acre for the two years 1959 and 1960. The high average weight of the steers at the time of purchase does not appear to be desirable for full benefit from the summer grazing and the 1961 program will be with more uniform animals averaging about 500 pounds in late March. It is proposed to conduct the 1961 program on a zero grazing basis so as to have some comparison of the methods that might be employed for using irrigated pasture.



Water spreads across a field via the gravity method of irrigation at the Pre-Development Farm.

Ref. No. 19904



Work proceeds on an outlet structure at the site of the Buffalo Pound Lake pumping operation.

Ref. No. 19509-9



## Buffalo Pound Lake Water Supply Project

Buffalo Pound Lake is located in the upper reaches of the Qu'Appelle Valley. This body of water has been improved through the construction of dykes and control works to constitute a storage reservoir to serve agricultural uses further down the valley. Recently, however, it has been used as one of the more important sources of urban water supply for the cities of Regina and Moose Jaw. To ensure the availability of water for this purpose, existing supplies have had to be supplemented by pumping water from the South Saskatchewan River over a height of land into the Qu'Appelle Valley at Elbow, thence through canals via the Qu'Appelle River system to Buffalo Pound Lake. Through an agreement with the Province of Saskatchewan, the Government of Canada accepted responsibility for constructing the diversion works required, and continuing responsibility for the operation and maintenance of the diversion facilities until replaced by the South Saskatchewan River Project.



The diversion canal skirting Eyebrow Lake. This is part of the Buffalo Pound Lake pumping project.

Ref. No. 20483

During the summer of 1960, some 6,570 acre feet of water were pumped into Buffalo Pound Lake by P. F. R. A. To reduce excessive evaporation losses in the Eyebrow Lake area of the Qu'Appelle River, a diversion canal was constructed around the north shore of the lake during the spring of 1960. This increased net delivery of water to Buffalo Pound Lake by 18 per cent as

compared with the year previous. Other major works carried out during the year included the raising of the Control Structure on Buffalo Pound Lake, the installation of a third standby pump at Elbow pumphouse No. 1, and trimming of bank slopes around pumphouse No. 1 to stabilize foundation conditions on the hillside next to the river in that general area.

### Emma Lake Conservation Project

Construction of a dam and appropriate spillway facilities on Spruce River was undertaken during the year. The purpose is to facilitate pumping of water from Spruce River over a summit into Emma Lake to maintain lake levels. The Department of Northern Affairs and National Resources has an interest in this project. Work on the project began in 1959 and was completed in October 1960.



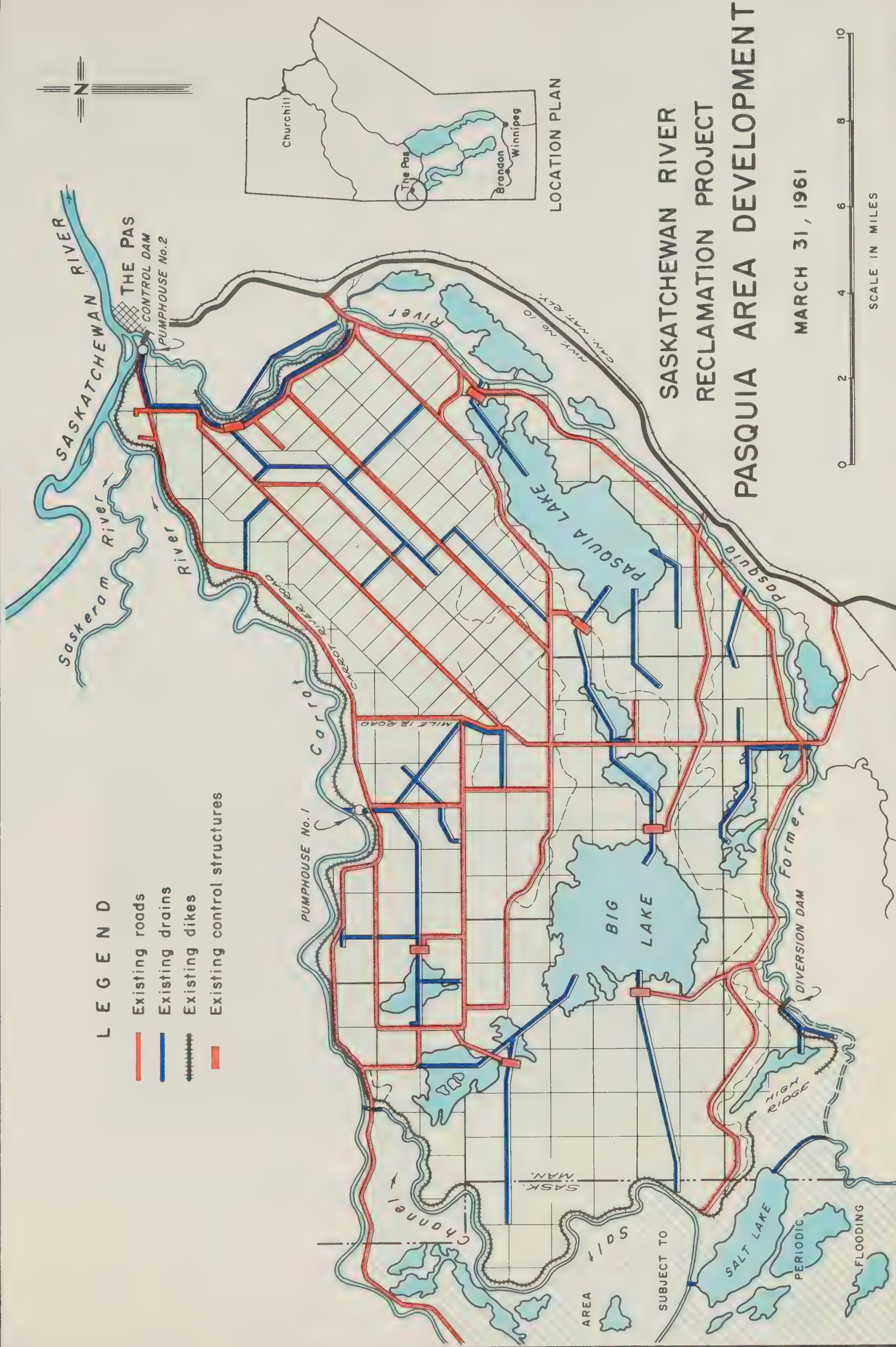
The Saskatchewan River flows past The Pas, Manitoba, with Pasquia Reclamation Project works at lower right.

Ref. No. 20877

### Saskatchewan River Reclamation Project

The delta of the Saskatchewan River has a total area of about 3,600 square miles and extends from Tobin Rapids in Saskatchewan, to Cedar Lake in Manitoba. About one-half of this area is potentially arable although subject









to frequent flooding. A pilot project aimed at the reclamation of approximately ten per cent of the possibly useful delta land was begun in 1953. The work is undertaken under a joint agreement wherein Canada assumes responsibility for all costs associated with building the main flood protective and drainage works, and Manitoba the cost of internal drainage, maintenance of works and settlement.

This year has seen the completion of Canada's share of the reclamation work. Manitoba is scheduled to take over the project in 1961 and to begin settlement of the new lands.

### Assiniboine River Project

At the request of Manitoba, a comprehensive review of the probable present-day costs and effects of several combinations of the many flood control proposals for the Assiniboine River was prepared during the year. This necessitated topographical surveys at the sites of the proposed Holland and Shellmouth reservoirs and reappraisal of all aspects of the suggested Portage la Prairie Diversion of the Assiniboine into Lake Manitoba, assuming it to be operated in conjunction with one or other of the reservoirs.



One of the control structures on the Pasquia Reclamation Project near The Pas, Manitoba.



The Assiniboine River dykes between Portage la Prairie and Winnipeg, were overtopped and damaged in many places by high water resulting from ice jams in mid-April 1960. The period between June and November was required to repair this damage and to build several sections of new dyke. This work was performed under P. F. R. A. direction by rented earth-moving equipment. Additional detailed topographical surveys of this lower reach of the river were carried on throughout the entire year.



A dyke to provide flood protection borders the river on the Assiniboine River Flood Control Project.

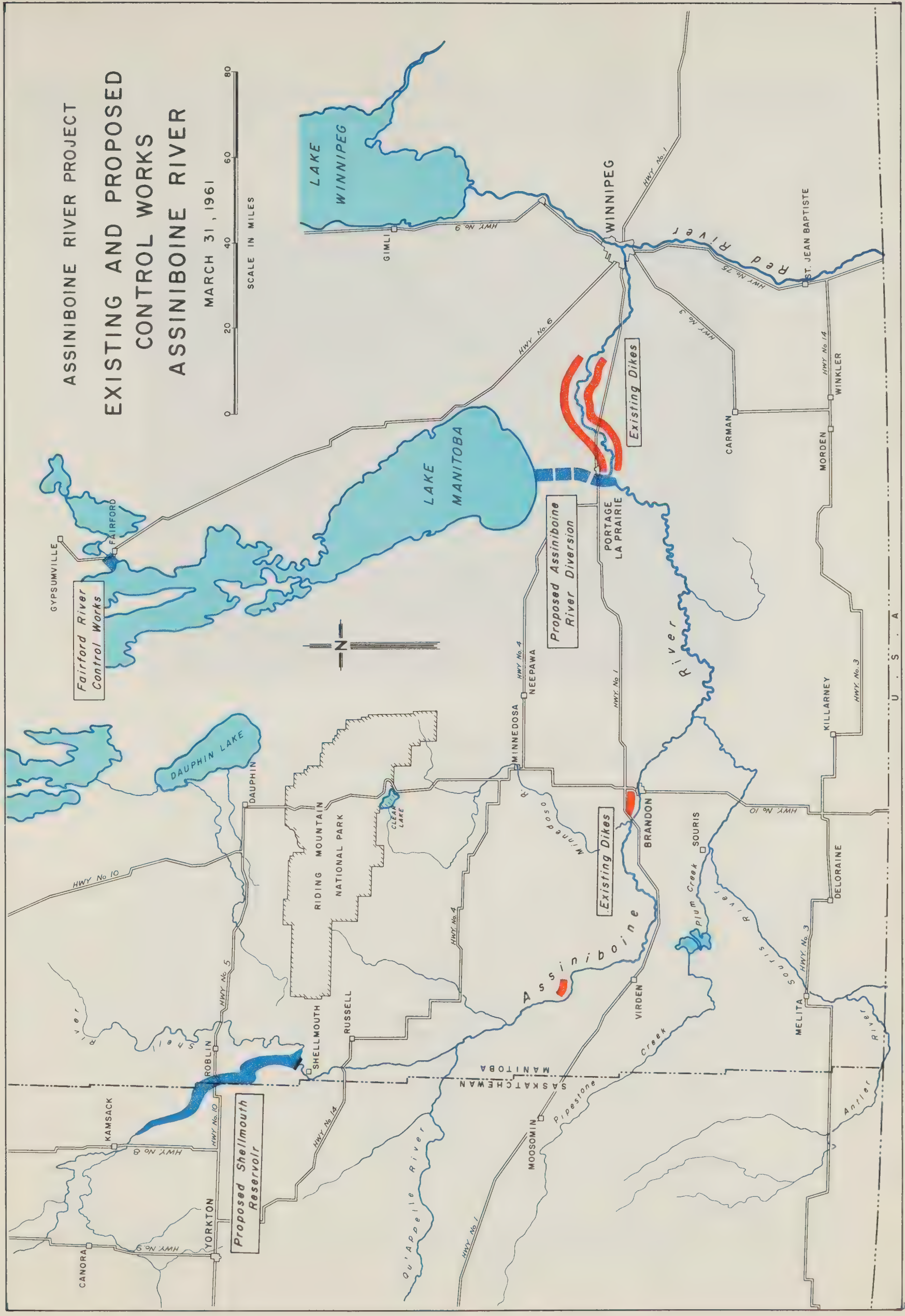
Ref. No. 21385

## Northwest Escarpment and Interlake Reclamation Projects

Under the terms of an agreement between Canada and Manitoba, mutually acceptable projects for flood control and land reclamation in this large area, were undertaken on an equal cost-sharing basis with P. F. R. A. supplying all engineering services required. This particular agreement was not renewed in 1960. Certain specific lands, however, were allocated for continuation of work on the Wilson Creek Experimental Watershed and for the completion of the Burnt Lake drain in the Interlake region, both of which were begun under the original agreement.

The Wilson Creek Experimental Watershed is located on the eastern slopes of the Riding Mountain, near McCreary, Man. During 1960 stream flow studies and detailed climatological observations were continued while





ASSINIBOINE RIVER PROJECT  
EXISTING AND PROPOSED  
CONTROL WORKS  
ASSINIBOINE RIVER

MARCH 31, 1961

SCALE IN MILES





certain vegetative and mechanical erosion control experiments were begun. Two storage reservoirs were created in the headwater areas of the stream by the construction of a system of earth dams and dykes.



Rocks contained in wire nets control erosion on a portion of riverbank on the Riding Mountain Reclamation Project.

Ref. No. 52045-4

Surveys were made to determine the progress of the channel scour that has taken place over the past ten years in the Edwards and Mink Creek drains. Repairs to sections of the bank protection work on the upper Edwards Creek, south of Dauphin, were completed in early summer. Engineering office studies having to do with the replacement of a control dam on the Mossy River and the development of a flood control scheme in the lower Pine River basin were undertaken in Winnipeg. This office also produced "as-constructed" drawings of all completed joint Federal-Provincial projects required in connection with the transfer of these jobs to the provincial authority for maintenance.

#### Fairford River Channel Improvements and Control Structure

Fluctuations in the elevation of the water level in Lake Manitoba have for many years been the cause of widespread flooding of agricultural land on the south and east shores of the lake. Lake Manitoba outflow is carried to

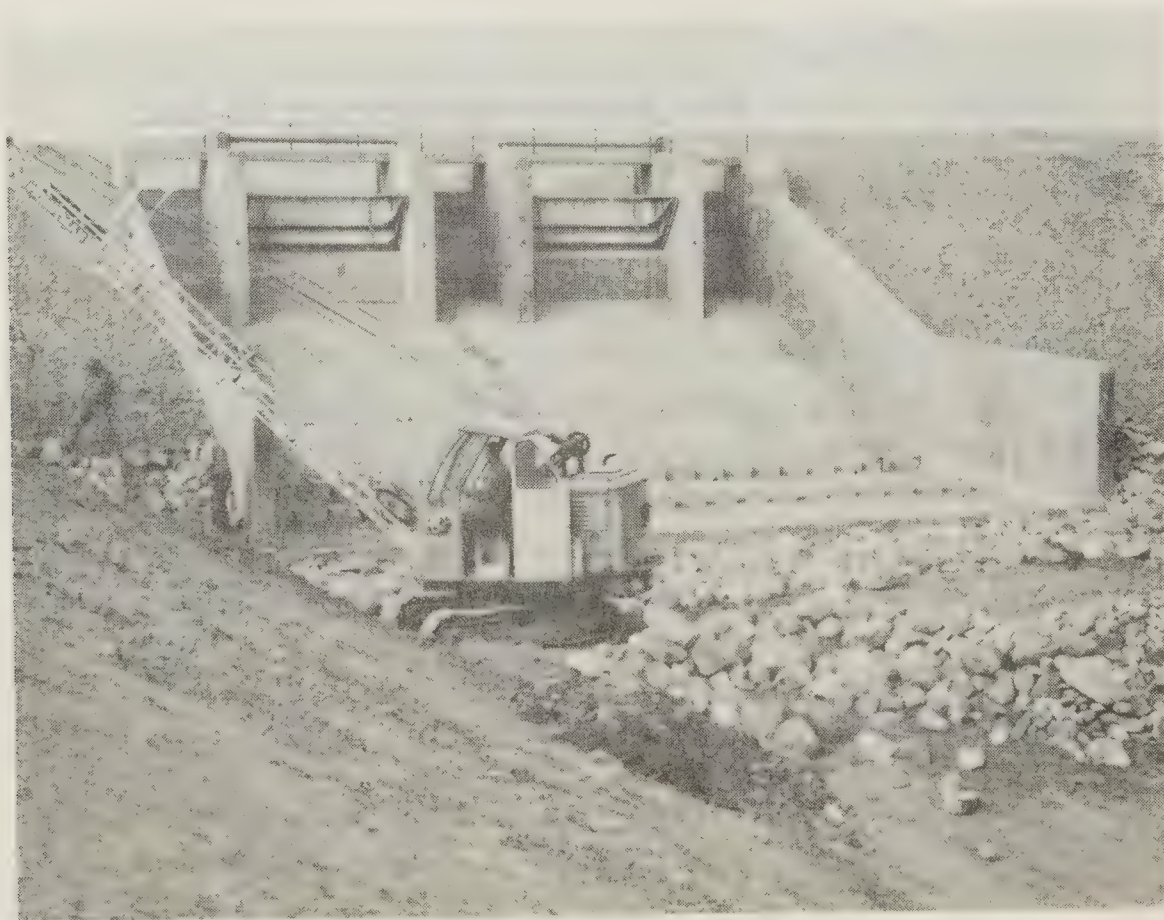


Lake Winnipeg by the Fairford River-Lake St. Martin-Dauphin River system, leaving Lake Manitoba near its northeast corner. Recommended modifications involve the improvement of the channel of the Fairford for approximately 8,000 feet, beginning 1,800 feet off-shore in Lake Manitoba, and the construction of a new control structure on the improved channel.

The Manitoba Department of Public Works produced a cost-benefit study of the proposals and a cost-sharing agreement was entered into between the Federal and Provincial Government with work starting late in 1960.

Two separate contracts, one amounting to \$263,000 for the channel work and the other to \$150,000 for a combined bridge and control structure, were let by the Province. The Federal-Provincial arrangement specifies that Canada will pay one-half the cost of the work covered by the former contract, and one-half the cost of that portion of the latter which is attributable to the control works only. An upper limit of \$300,000 has been set on the contribution of the federal authority.

Work on the channel began in November 1960, and over 60 per cent of the estimated quantity of excavation was moved before the end of the fiscal year. The construction of the substructure of the combined control dam and bridge was started in early December 1960. The foundations for the control structure were successfully completed by March 31, 1961.



A dragline helps construct a spillway at the Antelope Coulee Cutoff Serving the Eastern Irrigation District.



## Antelope Coulee Cutoff

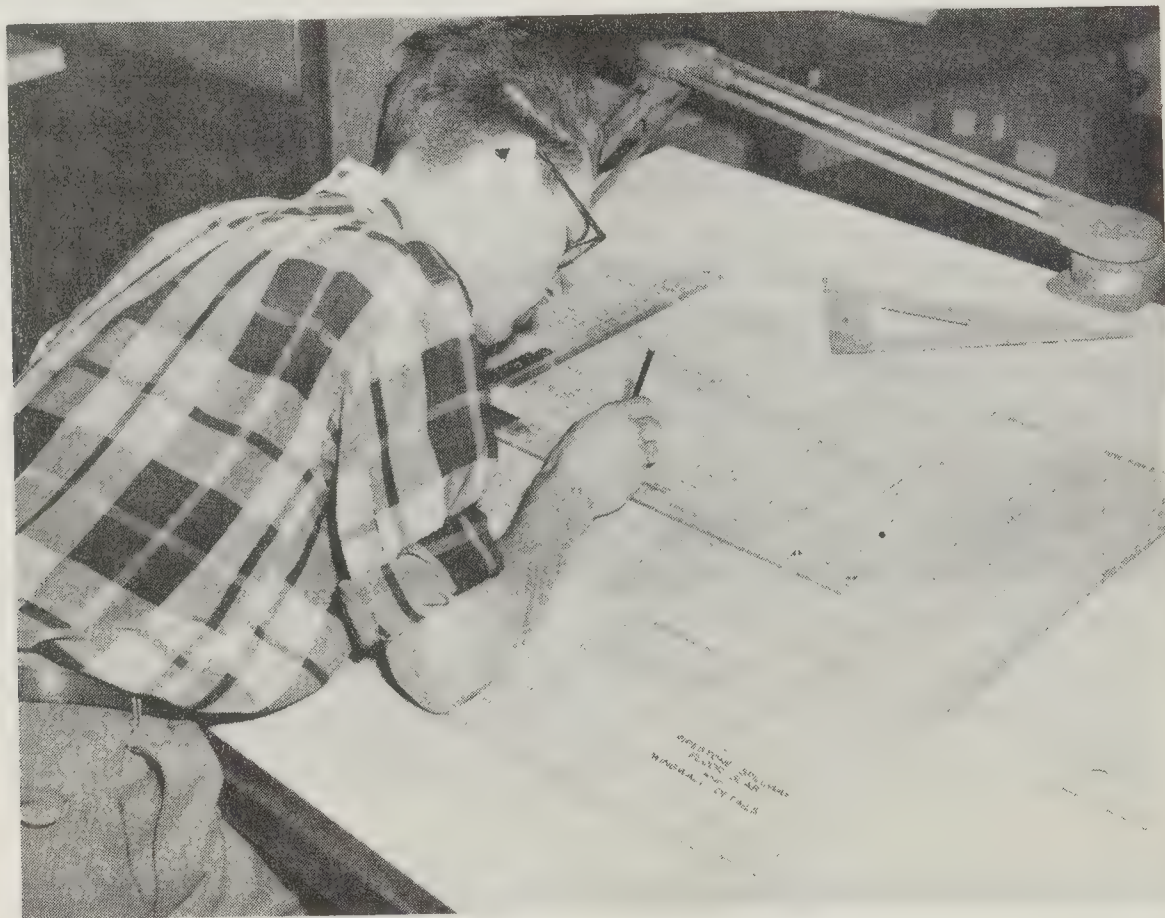
(Eastern Irrigation District)

The Antelope Coulee Cutoff is a new section of the Eastern Irrigation District main canal designed by P. F. R. A. to take the place of a badly deteriorated existing wood-stave and concrete syphon crossing Antelope Coulee. The work was undertaken under an agreement between the Eastern Irrigation District, the Government of Alberta, and the Government of Canada. Cost of construction was borne on a one-third share basis between each of the parties involved, with engineering and supervision services supplied by P. F. R. A. as part of Canada's share.

Plans called for the building of approximately one mile of canal capable of carrying water flows up to 1,200 cubic feet per second, as well as installation of three associated check and check-drop structures. Work commenced in 1959 and was completed in September 1960.

## ENGINEERING SERVICES

To provide the basic information required for the sound planning and construction of engineering projects undertaken by P. F. R. A. , a number of special divisions have been set up within the Organization under the general heading of Engineering Services.



A draftsman works on one of the thousands of plans prepared within the P.F.R.A. Engineering Services.

Ref. No. 2816

### Design Division

During the 1960-61 fiscal year, the South Saskatchewan River project again represented the major item of work for the Design Division. Work undertaken is set out in the section of this report dealing with the South Saskatchewan River Project.

In addition, plans and specifications were prepared for three projects on which contracts were subsequently let. These included revision to Parr Reservoir and the Morris River stockwatering dams, and the Antelope Coulee Cutoff - Stage 2. Complete plans were also prepared for six projects constructed by P. F. R. A. forces. These were the Altawan Project (Spangler Diversion Weir), the Bow River Project (inlet to West Arrowwood Syphon),



the Buffalo Pound Lake Project (revisions to Control Structure No.2), the Oxbow Project (new timber weir) the West Val Marie Project (new riparian outlet) and the Cabri Dam (new spillway). Plans and specifications were also prepared on two additional projects, the Cleland and Oungre dams, for which tenders will likely be called early in 1961. Extensive study was given to the following proposed projects - Antler Creek (Carnduff Dam), Berry Creek Project (renovations and additions), Esterhazy Dam, LaSalle River Project (three dams at LaSalle, Starbuck and Elie) and Sarnia Project. General studies were also undertaken on spillway and outlet works for small dams on the prairies.

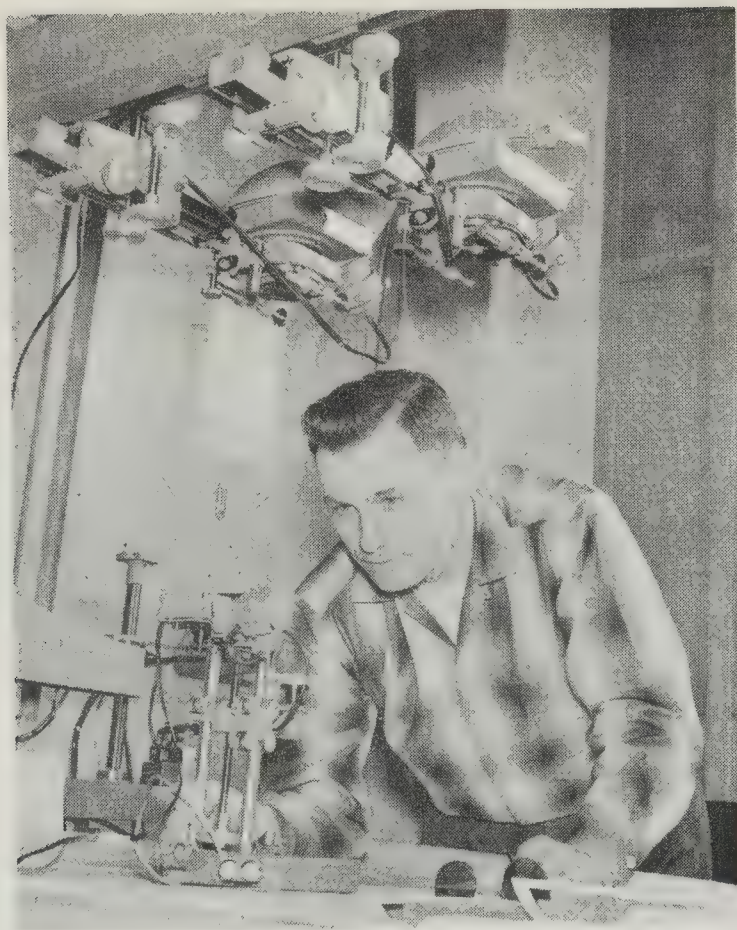


Water used for testing scale models of future structures flows down a mock spillway in the Hydraulics laboratory.

Ref. No. 22222

### Drafting Section

The Section produced nearly 900 finished drawings during the year, an increase over last year of 38 per cent. Other work undertaken included computing earthwork quantities, checking certain engineering calculations, assembling engineering reports and constructing experimental design models.



Adjusting a Balplex machine used in the Air Photo Analysis and Engineering Geology Division of P.F.R.A.

Ref. No. 17392

### Air Photo Analysis and Engineering Geology Division

During 1960-61, air photo reconnaissance studies were carried out for purposes of selecting damsites on Gainsborough Creek, Arm River, MacKay Creek, Avonlea Creek, Tobacco Creek, Wood River and Mossy River.

Preliminary air photo studies were made for the proposed Stuartburn, Foam Lake and Kelvington Community Pastures. Suggestions were made to assist in future development and management of the areas.

A land-use study was completed for the Serpentine Nicomekl River watershed. The watershed is located in southwestern British Columbia, and contains over 71,000 acres. Air photos were studied, and the land use tabulated to show the changes that have occurred from 1930 to 1958.

Two riprap studies were completed, one for the east end of Buffalo Pound Lake, and the other for the South Saskatchewan River Dam. Each study involved a preliminary office air photo reconnaissance study and a follow-up field investigation. Air photo searches for sand and gravel were confined to the Hanna district of Alberta, where over 200 deposits were mapped.



Two field engineering geology studies were also conducted in the Assiniboine valley during the year, one on the Holland Damsite, the other on the Shellmouth Damsite. A preliminary field investigation of the Gap Damsite on the Oldman River in Alberta was also carried out.

During the year photographs of the West Val Marie Reservoir were acquired at two scales, 1 inch equals 300 feet and 1 inch equals 500 feet. Photographs of the South Saskatchewan River damsites are being taken at monthly intervals through to December 1961, at scales of 1 inch equals 800 feet, and 1 inch equals 1,800 feet. These are being used to record construction progress.

New aerial photographs were also received through the Interdepartmental Committee on Air Surveys for the entire Qu'Appelle Valley, and for the Assiniboine Valley from Virden, Man., upstream to Sturgis, Sask. This photography was flown at a scale of 1 inch equals 2,640 feet, and will be used for engineering geology studies and for topographic mapping of potential damsites.

Progress continues in regard to photogrammetric plottings of topographic plans for the reservoir area of the South Saskatchewan River project, with 254 half-section sheets having been completed during the year to give complete coverage from the site area upstream to the Herbert Ferry.

Twenty-foot contours were mapped by photogrammetric means for a stretch of the Assiniboine Valley in the vicinity of Shellmouth, Man., to be used in future geological investigations and preliminary design of the proposed Shellmouth dam. Photogrammetric plotting was also completed on the West Val Marie reservoir, and on Sites 27 and 173 of the Upper Whitesand river.

The West Val Marie reservoir was plotted to 2-foot contours at a scale of 1 inch equals 150 feet, for use in reservoir capacity studies. The Upper Whitesand Sites were mapped to 10-foot contours at a scale of 1 inch equals 400 feet. These plans were used in reservoir capacity studies and for preliminary design.

#### Soil Mechanics and Materials Division

A basic function of the Division is the field exploration of structure sites. Working with six power drills and some hand operated equipment, members of the drilling staff recovered 20,000 samples at 32 sites on 28 different projects in Manitoba, Saskatchewan and Alberta. Fifty-two thousand lineal feet of test holes were drilled, about one half of which were on the South Saskatchewan River Project. In addition to the routine testing of materials, a separate investigation was continued in 1960-61 to evaluate concrete materials for the South Saskatchewan River Dam. Five hundred concrete and mortar mixes were performed with a variety of cement, pozzolan and aggregate combinations. Eight thousand cylinders and beams were cast for the study of sulphate resistance, compressive strength and alkali aggregate reaction.





Obtaining a soil sample for testing at the Soil Mechanics and Materials Division laboratory in Saskatoon.

Ref. No. 22569

The installation and observation of special test apparatus in earth dams and appurtenant structures were also continued. This is being done to detect movements and determine pore pressures in embankments and foundations during and after construction and for measurement of frost heave in spillways and drop structures during the winter. At the South Saskatchewan River Dam a special Lo-Var tape extensometer was built and calibrated. This will be used to observe diameter changes in the tunnel linings to determine the stresses in the structure. During 1960-61 the Division prepared ten soil mechanics and materials reports and twelve reports covering design studies and inspections of structures. Approximately 600 engineering plans were prepared by the drafting staff in the period.

At the request of the Indian Affairs Branch of the Department of Citizenship and Immigration, the Sipanok Fur project in northern Saskatchewan was inspected and a report giving observations and recommendations on the project was prepared. The division also co-operated with the Department of National Defence in discussion of the stability of trenches under bombing attack and made arrangements to assist in soil studies on the Greater Winnipeg Floodway project.





The laboratory of the Drainage Division at Vauxhall, Alta. where tests relating to drainage are run.

Ref. No. 3716

### Drainage Division

An important aspect of the drainage work has been to determine drainage characteristics of various soils encountered on irrigation projects in western Canada. Application of drainage findings is being made to proposed irrigation projects associated with the South Saskatchewan River project where special land classification investigations have been conducted in co-operation with the Province of Saskatchewan over the past two years. In addition, several large areas in southern Manitoba were investigated relative to suitability for irrigation development.

On other irrigated projects, technical assistance has been given with land leveling to improve surface drainage. This work has been associated mainly with irrigation development on the Bow River project in Alberta, although similar services are also made available to others on request.



Pumping tests to reduce high water table and salinity problems in the Upper and Lower 'V' districts of the Maple Creek project were continued during 1960. Approximately 658 acre feet of water were pumped by the two wells on the Upper 'V' and 1,313 acre feet of water by the three wells on the Lower 'V'. Changes in the salinity of the groundwater were significant. Water table levels showed a continued lowering due to pumping. Based on the present utilization of the groundwater and the more efficient operation of pumps, continuation of the pumping program into 1961 would appear warranted.

Also on the Upper 'V' project, a number of soil samples were taken at an old sampling site for more detailed study on soil salinity. Tests indicated that the salt status had decreased at the northern extremity of the project where the land had received heavy applications of water. Plans are being laid to follow salinity changes on newly levelled regressed areas under irrigation in conjunction with the pumping program.

Other activities of the Drainage Division during the year included sampling and analysis of soils proposed for flood irrigation on Pelican Lake, Archive Community Pasture and Kettlehut Lake, to determine their suitability for development. In addition, tile drainage investigations, irrigation efficiency studies, and groundwater observations were continued on the Bow River Irrigation project during the year.



A floating evaporation pan used in climatological studies conducted by the Hydrology Division of P.F.R.A.



## Hydrology Division

During 1960, the water supply was evaluated for 30 proposed reservoirs. This was done by reconstructing stream flow records where necessary, estimating water needs, and studying the adequacy of the proposed project to meet those needs. The reconstruction of stream flow records has been speeded up by current studies being undertaken for the Prairie Provinces Water Board. When completed, these studies will make possible a quick estimate of the available runoff for any stream on the prairies, once the drainage area, annual precipitation, and topographic characteristics are known.

To aid in spillway design, the flood potential for 33 projects was studied in 1960. These studies, based on daily stream flow data, are usually presented in tabular form, for example:

### DRY CREEK NEAR HORSTON

<u>The odds in any year are</u>	<u>that a mean daily flood peak will occur exceeding</u>
1 in 10 -	1,000 cubic feet per second
1 in 20 -	1,700 cubic feet per second
1 in 50 -	2,500 cubic feet per second

This work has been speeded up by the completion of the report "The Magnitude and Frequency of Floods in Alberta, Saskatchewan and Manitoba". This report describes a method for estimating the flood potential of any stream once the geographic location and drainage area are known.

Nine special investigations were undertaken in 1960. They ranged from "Hydrology of the Serpentine-Nicomekl Rivers Watershed" - a tidal stream with agricultural flooding problems aggravated by suburbanization - to measurements of the quality and quantity of water pumped from the South Saskatchewan River to Buffalo Pound Lake. A study of Great Rainstorms on the prairies is nearing completion. This study will permit more accurate estimates of the probable maximum flood for spillway design.

## CONSTRUCTION, EQUIPMENT and SUPPLY DIVISION

The diversity of P. F. R. A. activities necessitates a number of service facilities. Many of these are provided through this division in the form of equipment, materials, repair facilities, work crews and inspection services. During 1960-61 the demand for services increased substantially. These were provided without increase in staff other than casual and seasonal employees.

The main equipment depot with seven trade shops is located in Moose Jaw. During the year, the shops undertook repair work requiring the expenditure of \$148,150 for parts. This involved 120 different jobs on vehicles, 101 on trailers and 339 on units of mechanical equipment. New manufacture included 85 different jobs totalling \$103,500 and included 19 camp trailers; 200 water troughs, 4 fuel sheds, 16 sets of concrete forms, 115 signs, 25 pieces of laboratory equipment and 27 hardware jobs. This repair and manufacture work is in addition to work done by private businesses.

The field staffs are equipped to undertake jobs not ordinarily done by local contractors. Eighteen field crews undertook 129 jobs having a value of over \$464,000 of which more than 75 per cent was for material and supplies. Jobs included the rebuilding of the Cabri and Oxbow community water storage projects in addition to fireguarding in community pastures, repairing spillways, painting buildings and structures, and servicing electrical and heating equipment.

Purchases of vehicles, machinery, material and repair parts were made to the value of approximately \$500,000, about double that for 1959-60.

To facilitate the movement of equipment to various projects, a variety of truck and trailer combinations travelled some 216,000 miles. The estimated load was over 5,500 tons and necessitated 875 separate trips. This represented an increase of 62 per cent over the previous year, mainly because of the increased amount of field construction and maintenance work undertaken.

Fire prevention and safety programs are encouraged throughout the organization. An experienced supervisor conducts regular inspections of all headquarters and camps and submits appropriate reports. The favorable record of accidents and fire losses justifies this program.

The schedule of rental rates for equipment was revised during the past year and serves as a guide to rental operations throughout this area.



## PLANNING and INFORMATION DIVISION

The Planning and Information Division collects and assembles information pertaining to the history and development of P. F. R. A. for use in the preparation of reports, publications and articles. In addition, since 1959 the Division has become increasingly involved in publicity and public relations activities required by the organization, with particular reference to the South Saskatchewan River project.

### Information and Publicity Section

By far the largest percentage of work carried by this unit during 1960, was associated with publicity and public relations activities centering around the development of the South Saskatchewan River project. As a direct result of these activities, over 150 news items appeared in local newspapers, farm magazines, commercial publications and construction magazines. Of these, approximately 50 were feature presentations. Fairly continuous TV coverage was obtained through local outlets as well as nationally.

### Photo Section

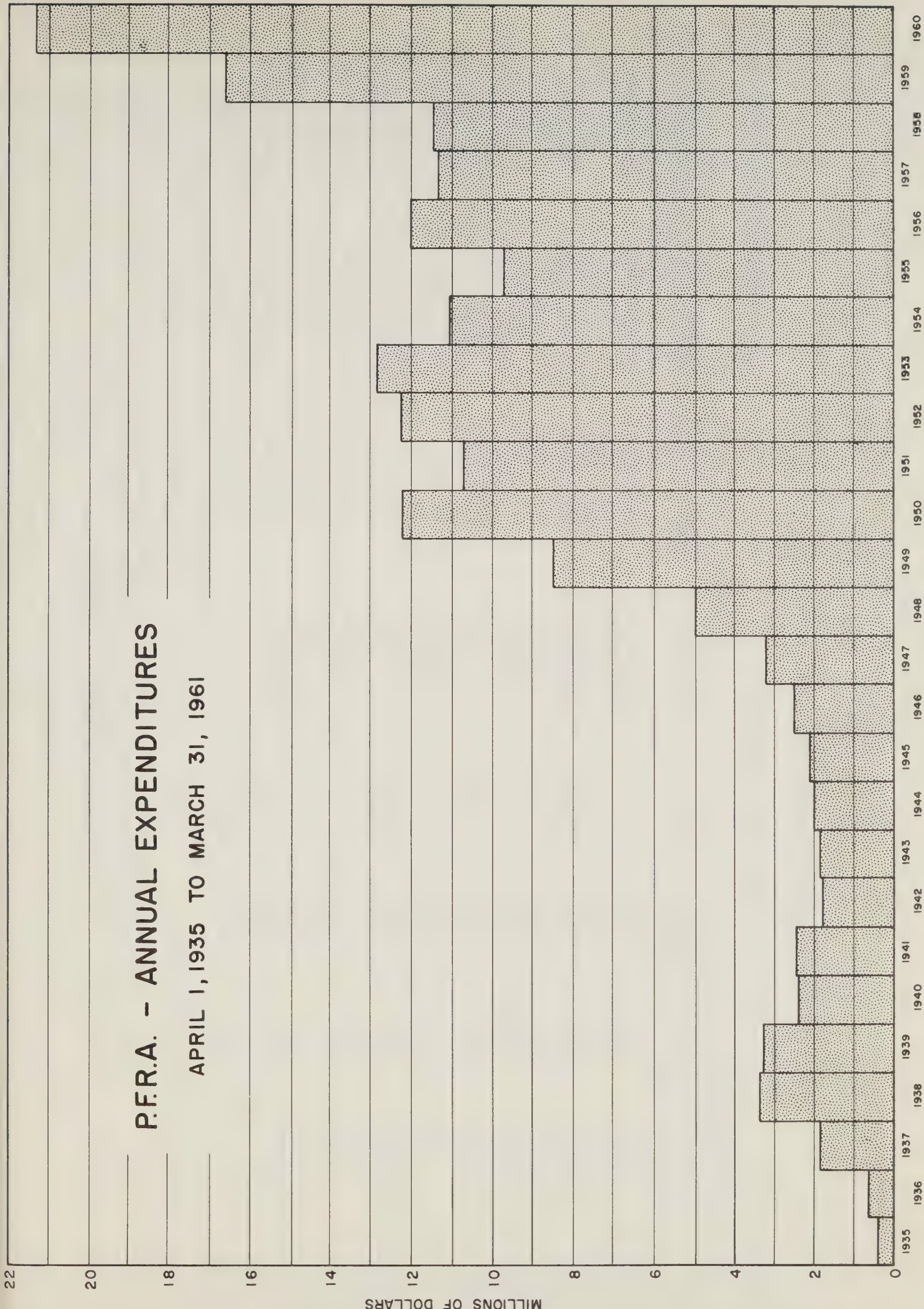
The photographic section of the Division maintains a continuous photographic record of P. F. R. A. activities. During 1960 this resulted in the processing of 1,368 individual requests involving the development of over 6,000 sheets of film, and the production of approximately 46,000 prints. Approximately 8,000 feet of movie film was shot this year, principally black and white film required for the production of TV shorts. In addition to wide acceptance of the film by local TV outlets in the three prairie provinces, over 85 per cent of the film was used on national networks.





P.F.R.A. - ANNUAL EXPENDITURES

APRIL 1, 1935 TO MARCH 31, 1961



YEARS (FISCAL)







# APPENDIX II

## WATER DEVELOPMENT PROGRAM

Number of Individual, Neighbor, Community and Large Water Development Projects and amount of financial assistance paid from April 1, 1960 to March 31, 1961

	DUGOUTS				DAMS				IRRIGATION PROJECTS				TOTALS	
	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid
MANITOBA														
Individual	594	125,256.75	6	1,422.71	14	10,618.33	614	137,297.79						
Neighbor	4	1,545.56	-	-	-	-	4	1,545.56						
Community	1	1,500.00	1	2,990.75	-	-	2	4,490.75						
Large Water	-	-	2	225,725.82	-	-	2	225,725.82						
TOTAL	599	128,302.31	9	230,139.28	14	10,618.33	622	369,059.92						
SASKATCHEWAN														
Individual	2,803	576,538.46	269	40,342.33	104	37,765.30	3,176	654,646.09						
Neighbor	30	13,637.91	2	609.00	6	4,223.24	38	18,470.15						
Community	17	21,277.31	6	29,627.77	2	11,103.44	25	62,008.52						
Large Water	-	-	3	179,468.37	-	-	3	179,468.37						
TOTAL	2,850	611,453.68	280	250,047.47	112	53,091.98	3,242	914,593.13						
ALBERTA														
Individual	1,146	226,644.69	213	32,611.13	44	12,411.58	1,403	271,667.40						
Neighbor	-	-	1	642.89	-	-	1	642.89						
Community	7	24,473.88	3	10,062.00	-	-	10	34,535.88						
Large Water	-	-	-	-	-	-	-	-						
TOTAL	1,153	251,118.57	217	43,316.02	44	12,411.58	1,414	306,846.17						
GRAND TOTAL	4,602	990,874.56	506	523,502.77	170	76,121.89	5,278	1,590,499.22						



APPENDIX III

WATER DEVELOPMENT PROGRAM

Number of Individual, Neighbor, Community and Large Water Development Projects and amount of financial assistance paid from April 1, 1935 to March 31, 1961

	DUGOUTS				DAMS				IRRIGATION PROJECTS				TOTALS	
	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid
MANITOBA														
Individual	12,578	1,375,053.63	328	26,622.93	191	64,935.37	13,097	1,466,611.93						
Neighbor	63	13,854.86	15	4,496.20	8	2,212.62	86	20,563.68						
Community	7	12,530.86	24	131,160.47	2	30,582.54	33	174,273.87						
Large Water	-	-	20	1,281,690.82	6	617,217.00	26	1,898,907.82						
TOTAL	12,648	1,401,439.35	387	1,443,970.42	207	714,947.53	13,242	3,560,357.30						
SASKATCHEWAN														
Individual	36,759	4,569,332.16	4,726	429,051.60	2,396	574,048.53	43,881	5,572,432.29						
Neighbor	339	95,150.31	56	12,299.94	105	47,303.33	500	154,753.58						
Community	321	271,387.51	186	988,749.23	67	644,643.52	574	1,904,780.26						
Large Water	-	-	37	3,135,867.37	35	4,079,910.00	72	7,215,777.37						
TOTAL	37,419	4,935,869.98	5,005	4,565,968.14	2,603	5,345,905.38	45,027	14,847,743.50						
ALBERTA														
Individual	7,623	975,898.63	2,644	268,760.23	1,105	267,598.12	11,372	1,512,256.98						
Neighbor	41	11,787.11	14	3,960.99	15	5,033.69	70	20,781.79						
Community	50	96,260.79	111	727,328.04	53	660,461.02	214	1,484,049.85						
Large Water	-	-	4	26,632.00	18	693,004.00	22	719,636.00						
TOTAL	7,714	1,083,946.53	2,773	1,026,681.26	1,191	1,626,096.83	11,678	3,736,724.62						
GRAND TOTAL	57,781	7,421,255.86	8,165	7,036,619.82	4,001	7,686,949.74	69,947	22,144,825.42						

APPENDIX IV  
COMMUNITY WATER STORAGE AND IRRIGATION PROJECTS  
To March 31, 1961

(Community Projects costing less than \$1,000.00 are grouped under the heading of Small Community Projects in Appendices II and III)

MANITOBA

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Alexander Soil Conservation	Alexander	Soil Conservation	1944	—	—	5,250.00
Birtle Dam	Birtle	Stockwatering Dam	1947	—	—	11,490.00
Boissevain	Boissevain	Storage Dam	1954	—	580	29,992.00
Brandon Flood Irrigation	Brandon	Flood Irrigation	1949	1,000	—	27,107.00
Brandon Water Supply	Brandon	Storage Dam	1940	—	500	3,996.00
Clearwater Storage	Clearwater	Stockwatering Dam	1938	—	12	5,949.00
Crystal City Storage	Crystal City	Stockwatering Dam	1935	—	3	3,334.00
Dead Lake Community	Gladstone	Irrigation	1950	20	90	1,933.00
Edwards, R.M. of	Melita	Stockwatering Dam	1935	—	100	10,214.00
Hague Dam	Sanford	Stockwatering Dam	1953	—	—	29,183.00
Hampson Dam	Sanford	Storage Dam	1954	—	420	16,899.00
Hartney	Hartney	Irrigation	1941	—	—	10,264.00
Killarney	Killarney	Multi-purpose Dam	1956	—	800	41,965.00
LaSalle River Dams	LaSalle	Stockwatering Dam	1941	—	900	22,989.00
Lewko Dam	Sanford	Storage Dam	1954	—	320	20,874.00
Little Souris River Dam	Melita	Stockwatering Dam	1945	—	250	1,380.00
Mary Jane Storage Project	Manitou	Multi-purpose Dam	1959	—	1,150	89,644.00
McAuley Community Dam	McAuley	Stockwatering Dam	1955	—	20	2,051.00
Melita	Melita	Irrigation	1941	3,900	3,200	11,372.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Minnedosa Dam	Minnedosa	Storage Dam	1950	20	1,500	105,051.00
Morden Dam (Dead Horse Creek)	Morden	Irrigation	1941	100	1,200	344,274.00
Morris River Dams (3)	Morris	Stockwatering Dams	1960	—	207	64,232.00
Morris River-Rock Lake	Carmen	Stockwatering Dam	1940	—	10,000	23,401.00
Napinka	Napinka	Irrigation	1941	—	—	6,770.00
Neepawa Storage Project	Neepawa	Multi-purpose Dam	1960	—	4,000	345,238.00
Oak Lake	Oak Lake	Irrigation	1956	13,000	—	119,205.00
Park Lake	Neepawa	Stockwatering	1953	—	—	21,626.00
Plum Coulee	Plum Coulee	Multi-purpose Res.	1957	—	12	5,939.00
Plumas	Plumas	Multi-purpose Dam	1960	—	30	2,991.00
Rivers Dam	Rivers	Multi-purpose Res.	1960	—	26,000	1,083,392.00
Roland	Roland	Stockwatering Dugout	1957	—	1.5	1,000.00
Rosebank Dam	Rosebank	Stockwatering	1948	—	32	12,161.00
Roseau River Dam	Dominion City	Multi-purpose Dam	1957	—	—	54,705.00
Shoal Lake Project	Shoal Lake	Stockwatering	1948	—	3,500	8,491.00
Souris Dam	Souris	Multi-purpose Dam	1952	—	150	73,597.00
Souris, Town of	Souris	Stockwatering Dam	1935	—	150	3,841.00
St. Malo Dam	St. Malo	Multi-purpose Dam	1958	—	1,770	266,937.00
St. Lazare Storage Reservoir	Lazare	Stockwatering	1948	—	5	1,470.00
Turtle Mountain Reservoir	Boissevain	Multi-purpose Res.	1956	70	600	11,968.00
Wawanesa	Wawanesa	Irrigation	1941	—	—	125,332.00
Westbourne, R.M. of	Gladstone	Stockwatering	1947	—	—	5,993.00
Whitemud River	Woodside	Stockwatering	1949	—	160	6,506.00
Whitemud River Storage	Gladstone	Stockwatering Dam	1943	—	660	11,464.00
SASKATCHEWAN						
Abbey	Abbey	Stockwatering Dugout	1958	—	1.5	1,000.00
Abound	Caron	Multi-purpose Res.	1960	—	200	5,210.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Adair Creek	Wolseley	Multi-purpose Dam	1956	40	350	59,849.00
Adam's Lake	Battle Creek	Irrigation	1936	1,500	2,000	8,831.00
Admiral Storage Dam	Admiral	Irr. & Stockwatering	1949	2,000	2,200	38,520.00
Allan	Allan	Stockwatering	1948	-	300	4,477.00
Altawan	Govenlock	Irrigation	1960	1,000	5,830	261,479.00
Alsask	Alsask	Multi-purpose Res.	1958	-	30	9,710.00
Arcola	Arcola	Stockwatering Dam	1939	-	(underground)	17,310.00
Arena	Arena	Irr. & Stockwatering	1949	1,600	3,200	5,218.00
Arrarat	Abbey	Stockwatering Dam	1959	-	6	7,398.00
Artland Grazing	Marsden	Dugout	1955	-	1.5	1,000.00
Avon Heights Grazing Co-op.	Shaunavon	Stockwatering	1955	-	60	2,428.00
Avonhurst	Qu'Appelle	Stockwatering	1956	-	1.5	3,200.00
Avonlea	Avonlea	Dugout	1959	-	3	2,170.00
Balcarres	Balcarres	Stockwatering	1948	-	100	7,203.00
Balcarres Storage	Balcarres	Stockwatering	1953	-	20	10,294.00
Bateman	Gravelbourg	Irr. & Stockwatering	1949	400	114	4,739.00
Battleford	N. Battleford	Irrigation (pump)	1941	800	-	3,058.00
Beadle	Eston	Dugout	1959	-	3	1,393.00
Beadle Project	Eston	Dugout	1960	-	-	1,393.00
Beaver Creek	Hanley	Stockwatering	1951	-	200	7,998.00
Beechy #1	Beechy	Irr. & Stockwatering	1946	600	1,000	12,746.00
Beechy #2	Beechy	Irr. & Stockwatering	1948	200	100	6,240.00
Beechy Co-op.	Beechy	Stockwatering Dugout	1957	-	1.5	1,000.00
Belvoir	Glamis	Dugout	1959	-	3	1,484.00
Bengough Agricultural Community Project	Bengough	Dugout	1960	-	-	1,000.00
Bengough, R.M. of	Bengough	Stockwatering Dugout	1957	-	1.5	1,000.00
Big Arm Storage	Liberty	Irrigation	1939	5,000	5,200	13,161.00
Black Hills Grazing Co-op.	Piapot	Dugout	1955	-	5	2,520.00
Boharm	Boharm	Stockwatering	1948	-	100	6,250.00
Bracken	Bracken	Stockwatering	1946	-	158	1,001.00
Braddock Dam	Braddock	Irrigation	1952	2,000	1,600	83,999.00
Brightwater Creek	Hanley	Irrigation	1956	2,500	3,500	11,713.00
Brightwater Lake	Dundurn	Irrigation	1960	7,000	-	4,054.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Brown Hill Dam	Grenfell	Multi-purpose Dam	1958	-	275	99,394.00
Buffalo Pound	Qu'Appelle Valley	Irrigation	1940	x	-	83,723.00
Buffalo Valley	Wiseton	Dugout	1960	-	-	1,000.00
Burstall	Burstall	Dugout	1960	-	-	1,500.00
Cabri	Cabri	Stockwatering	1948	-	340	37,553.00
Cabri Dam (Spillway)	Cabri	Stockwatering	1960	-	340	29,107.00
Cadillac	Cadillac	Irrigation	1945	800	1,350	32,887.00
Camberly	Camberly	Irrigation & Dam	1950	-	100	2,106.00
Canora	Canora	Storage Dam	1941	-	300	16,128.00
Caron	Caron	Storage	1948	-	100	17,109.00
Caron Water Development	Thunder Creek	Storage Dam	1944	-	43,500	710,433.00
Cedoux	Cedoux	Stockwatering	1947	-	314	4,999.00
Ceylon Reservoir	Ceylon	Irrigation & Dam	1952	300	250	8,087.00
Chapleau Lake	Montmartre	Stockwatering	1949	-	3,530	8,208.00
Clair Creek	Wadena	Flood Irrigation	1957	100	-	1,877.00
Claydon	Claydon	Multi-purpose Res.	1957	-	30	2,498.00
Claydon	Claydon	Irrigation	1959	700	300	7,015.00
Clearfield	Goodwater	Irrigation & Dam	1951	70	300	5,999.00
Colgate	Colgate	Flood Irrigation	1958	320	-	7,110.00
Conquest, Village of	Conquest	Dugout	1954	-	1.5	1,000.00
Congress-Stonehenge	Limerick	Stockwatering Dugout	1958	-	2	1,000.00
Consul-Vidora	Vidora	Irrigation	1950	3,000	-	62,500.00
Coronach	Coronach	Irrigation & Dam	1947	300	1,450	97,807.00
Craven Dam	Qu'Appelle Valley	Irrigation	1943	x	-	33,675.00
Crooked & Round Lake	Qu'Appelle Valley	Irrigation	1941	x	-	48,650.00
Cypress Storage	Ravenscrag	Irrigation	1939	20,000	80,000	467,691.00
Coleville, Village of	Coleville	Dugout	1958	-	1.5	1,000.00
Cupar	Cupar	Irrigation	1960	3,000	-	6,733.00
Dalmeny	Dalmeny	Stockwatering	1951	-	3	1,000.00
Davidson	Davidson	Irrigation	1937	100	277	3,114.00
Davidson Storage Project	Davidson	Multi-purpose Dam	1959	-	400	36,006.00
Davin	Kronau	Stockwatering	1947	-	1,080	13,501.00
Dead Lake	Macour.	Irrigation	1941	Souris River Development		17,528.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Delisle	Delisle	Stockwatering	1950	-	45	4,899.00
Demaine	Demaine	Dugout	1960	-	-	1,000.00
Dixon Lake	Spring Valley	Irrigation	1959	500	2,500	13,951.00
Doonside Dam	Wawota	Irrigation	1955	1,500	1,500	3,438.00
Downey Lake	Maple Creek	Stockwatering Dam	1958	-	58	1,404.00
Dry Coulee	Eastend	Stockwatering Dam	1958	-	10	1,605.00
Dry Lake	Forward	Stockwatering	1949	-	600	9,729.00
Dunn & Watt	Mankota	Irrigation	1937	305	-	2,996.00
Dunning	Radville	Irrigation	1951	120	200	3,566.00
Dummer	Milestone	Irrigation & Dam	1949	500	200	4,742.00
Doddsland	Druid	Dugout	1958	-	1.5	1,000.00
Eagle Hill Creek	Plenty	Stockwatering	1946	-	10,700	6,432.00
Eagle Lake	Coleville	Irrigation & Dam	1949	2,000	3,000	5,998.00
Eastend	Eastend	Irrigation	1939	4,000	1,300	161,682.00
Eastview	Eastview	Stockwatering	1949	-	200	5,970.00
Eatonia	Eatonia	Stockwatering	1949	-	12	1,199.00
Echo Lake	Qu'Appelle Valley	Irrigation	1943	x	-	41,753.00
Egg Lake	Avonhurst	Multi-purpose Res.	1957	800	-	10,047.00
Elfros	Elfros	Stockwatering	1949	-	25	7,330.00
Emerald Hill	Milestone	Stockwatering	1958	-	250	7,582.00
Eston	Eston	Stockwatering	1954	-	10	11,469.00
Fahlman's Creek Project	Balgonie	Stockwatering	1949	-	400	15,599.00
Fairy Hill	Qu'Appelle Valley	Irrigation	1941	x	-	4,302.00
Fife Lake Restoration	Constance	Irrigation & Dam	1954	1,200	-	9,596.00
Fife Lake #2	Constance	Irrigation & Dam	1954	650	-	6,348.00
Fillmore	Fillmore	Stockwatering Dugout	1958	-	1.5	1,000.00
Fleming	Fleming	Dugout	1960	-	-	1,000.00
Fleming Creek	Moosomin	Stockwatering	1950	-	75	3,282.00
Foam Lake (Elfros)	Foam Lake	Irrigation	1957	4,000	-	11,964.00
Francis Lake	Morse	Irrigation	1956	1,560	-	17,305.00
Frenchman Flats	Dundurn	Irrigation	1949	1,800	2,800	9,996.00
Frenchville	Frenchville	Irrigation & Dam	1947	430	670	8,096.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Gibson Flats	Pennant	Irrigation	1953	1,200	-	14,177.00
Girvin	Girvin	Stockwatering Dam	1937	-	19	2,180.00
Glenside	Glenside	Stockwatering	1948	-	150	3,286.00
Glidden, Village of	Glidden	Dugout	1959	-	3	1,200.00
Gooseberry Lake	Corning	Stockwatering	1948	-	2,500	8,783.00
Gouverneur Dam	Ponteix	Irrigation	1952	6,000	10,000	242,468.00
Graham-Rogers	Qu'Appelle	Irrigation	1959	500	-	2,780.00
Grattle Grazing Co-op.	Hoosier	Dugout	1960	-	3	1,495.00
Gravelbourg South	Gravelbourg	Irrigation	1948	600	1,500	8,186.00
Gravelbourg Storage	Gravelbourg	Irrigation	1947	500	-	1,917.00
Grosnick	Lake Alma	Stockwatering Dugout	1957	-	1.5	1,000.00
Gunn Grazing Co-op.	Shaunavon	Multi-purpose Res.	1957	-	10	1,632.00
Gull Lake	Gull Lake	Multi-purpose Res.	1960	-	80	1,850.00
Hague Dugout	Hague	Stockwatering	1950	-	2	1,000.00
Hazlet	Hazlet	Multi-purpose Dam	1960	-	500	3,550.00
Hodgeville	Hodgeville	Stockwatering	1949	-	5	2,748.00
Hanley	Hanley	Stockwatering	1946	-	60	3,797.00
Harris Reservoir	Maple Creek	Irrigation	1956	1,000	5,000	238,074.00
Haunted Hills Grazing Co-op.	Moose Jaw	Stockwatering Dam	1959	-	10	1,640.00
Hoosier, Hamlet of	Hoosier	Dugout	1959	-	3	1,190.00
Hugonard Coulee Dam	Lebret	Multi-purpose Dam	1956	100	400	64,231.00
Jackfish Creek	Meota	Stockwatering Dam	1943	-	90	2,940.00
Jumping Deer Creek	Lipton	Stockwatering	1947	-	145	6,092.00
Kaposvar	Stockholm	Stockwatering	1947	-	290	11,946.00
Kaposvar Creek	Melville	Stockwatering Dam	1954	-	1,400	102,747.00
Katepwa Weir	Katepwa	Dam	1957	-	-	61,192.00
Kelfield	Kelfield	Stockwatering	1947	-	25	4,927.00
Kerrobert	Kerrobert	Multi-purpose Res.	1957	-	40	11,554.00
Kincaid	Kincaid	Stockwatering	1956	-	10	2,539.00
Kindersley	Kindersley	Stockwatering	1949	-	300	2,007.00
Kisbey Flats	Kisbey	Irrigation	1939	2,300	5,000	23,211.00
Koch-Froh	Qu'Appelle	Multi-purpose Res.	1956	160	-	2,390.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Lack Pelletier	Lac Pelletier	Stockwatering Dam	1937	—	3,350	2,139.00
Lacadena	Lacadena	Irrigation	1954	—	—	9,678.00
Lafleche	Lafleche	Stockwatering Dam	1940	—	38	2,524.00
Lafleche Dam	Lafleche	Multi-purpose Dam	1957	15,000	30,120	627,922.00
Lajord	Lajord	Dam	1936	—	300	13,800.00
Lake of the Rivers	Assiniboia	Stockwatering Dam	1938	—	300	10,805.00
Lancer Water Users	Lancer	Irrigation	1953	1,265	—	35,000.00
Langenburg	Langenburg	Irrigation & Dam	1949	800	200	11,752.00
Langenburg	Langenburg	Irrigation	1954	—	2.5	3,000.00
Larsen	Radville	Multi-purpose Dam	1957	—	500	36,437.00
Last Mountain Lake	Qu'Appelle Valley	Irrigation	1941	x	—	42,721.00
Lebret	Qu'Appelle Valley	Irrigation	1941	x	—	16,307.00
Lemsford	Lemsford	Stockwatering Dugout	1957	—	1.5	1,000.00
Linacre Co-op.	Fox Valley	Dugout	1960	—	—	1,100.00
Little Manitou Lake	Watrous	Dam	1957	—	—	39,271.00
Lone Tree Municipality	Climax	Dugout	1960	—	—	1,200.00
Lonesome Lake	Vidora	Irrigation	1949	900	800	2,771.00
Long Creek #1	Estevan	Stockwatering Dam	1938	—	137	8,729.00
Long Creek #2	Estevan	Stockwatering Dam	1938	—	90	8,701.00
Loon Creek	Markinch	Stockwatering Dam	1945	—	700	7,180.00
Lucky Lake	Lucky Lake	Stockwatering	1946	—	120	7,596.00
McIntosh Slough	Golden Prairie	Irrigation	1949	500	1,500	1,990.00
Macklin Storage	Macklin	Stockwatering	Incomplete	—	40	967.00
Maple Creek	Maple Creek	Irrigation	1938	10,000	23,260	356,179.00
Maple Grove	Goodwater	Dam	1959	—	330	5,988.00
March Flood Irrigation	Cedoux	Irrigation	1948	400	—	1,765.00
Martin Co-op.	Maple Creek	Dugout	1960	—	—	4,230.00
Masefield	Masefield	Stockwatering	1938	—	40	3,187.00
Masefield Water Users	Masefield	Multi-purpose Dam	1957	500	250	7,999.00
Matador	Matador	Irrigation & Dam	1946	120	220	5,216.00
Maymont	Maymont	Dugout	1959	—	1.5	1,200.00
Maxim Lake	Maxim	Stockwatering	1949	—	5,000	20,472.00
McCraney, R.M. of	Kenaston	Stockwatering Dam	1937	—	350	1,896.00
McDonald Creek	McCord	Irrigation & Dam	1950	400	90	4,992.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
McGurk Lake	Carlyle	Dam	1960	—	2,000	3,128.00
Meadowland	Macklin	Irrigation	1954	500	—	6,370.00
Meeting Lake	Redfield	Stockwatering	1949	—	100	2,683.00
Melaval	Melaval	Stockwatering	1950	—	18	1,200.00
Meota, R.M. of	Meota	Dugout	1953	—	1.5	1,000.00
Middle Creek	Battle Creek	Irrigation	1937	1,000	20,000	18,663.00
Mine Coulee	Neptune	Stockwatering	1948	—	40	4,377.00
Miry Creek, R.M. of	Abbey	Dam	Incomplete	—	20	4,680.00
Montague Lake	Assiniboia	Irrigation	1953	235	—	1,000.00
Moose Jaw Creek	Lang	Irrigation	1938	2,250	2,180	7,618.00
Moose Mountain	Corning	Irrigation	1937	—	8,000	14,829.00
Moosomin Dam (Keenan Bridge)	Moosomin	Multi-purpose Dam	1954	—	9,000	449,184.00
Muenster	Muenster	Irrigation	1949	25	11	2,754.00
Muenster	Muenster	Multi-purpose Dam	1960	—	80	8,085.00
Neudorf	Neudorf	Multi-purpose Res.	1958	—	—	1,790.00
Newburn Lake	Invermay	Irrigation & Dam	1952	50	1,280	6,477.00
North Herbert Extension	Herbert	Irrigation	Incomplete	—	—	511,909.00
North Portal	North Portal	Dugout	1959	—	2	1,810.00
North Qu'Appelle	Fort Qu'Appelle	Stockwatering Dam	1948	—	100	2,386.00
Oakdale Municipality	Coleville	Dugout	Incomplete	—	—	1,020.00
Orkney	Orkney	Stockwatering Dam	1958	—	10	1,982.00
Oxbow Dam	Oxbow	Irrigation	1941	3,900	3,200	17,436.00
Pangman	Pangman	Multi-purpose Res.	1957	30	125	5,533.00
Pasqua	Moose Jaw	Stockwatering	1948	—	40	3,777.00
Pike Lake	Vanscoy	Irrigation & Dam	1948	900	2,500	7,360.00
Pinkham Co-op.	Pinkham	Dugout	1960	—	—	1,497.00
Pinkham Project	Kindersley	Dugout	1960	—	—	1,000.00
Pinto Creek	Kincaid	Dugout	1960	—	—	1,000.00
Pipestone Lake	Broadview	Stockwatering Dam	1938	—	1,600	11,785.00
Pheasant Creek	Lemberg	Storage	1954	—	500	114,464.00
Poplar River	Coronach	Irrigation & Dam	1950	300	900	14,838.00
Portreeve	Portreeve	Stockwatering Dugout	1957	—	1.5	1,000.00
Primate	Primate	Stockwatering Dugout	1957	—	1.5	1,000.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Radville	Radville	Stockwatering	1947	—	32	5,019.00
Reciprocity	Glen Ewen	Irrigation & Dam	1949	2,000	1,750	27,410.00
Redford	Wilkie	Stockwatering	1951	—	160	1,814.00
Richman Irrigation	Glen Bain	Irrigation	1949	—	1,000	4,607.00
Richardson-McKinnon	Consul	Irrigation	1946	3,000	—	53,913.00
Ridgeway Flats	Qu'Appelle	Multi-purpose	1957	65	80	2,054.00
Rinfret	Weyburn	Dugout	1959	—	6	6,997.00
Rockglen Grazing	Rockglen	Irrigation & Dam	1955	600	300	13,455.00
Rosedale	Hanley	Irrigation	1948	60	100	1,016.00
Rosthern Water Storage	Rosthern	Storage Dam	1958	—	160	22,613.00
Rough Bark Creek	Goodwater	Stockwatering Dam	1937	—	1,500	9,314.00
Round Hill Water Users	N. Battleford	Irrigation & Dam	1950	425	50	4,791.00
Ruddell, Village of	Ruddell	Dugout	1959	—	1.5	1,000.00
Russell Creek	Pambrun	Irrigation	1951	1,000	2,000	66,493.00
Rockfield	Trossachs	Multi-purpose Res.	1960	—	200	6,850.00
Saline	Invermay	Multi-purpose Res.	1958	1,000	—	2,377.00
Saltcoats	Bredenbury	Dugout	1960	—	—	1,000.00
Salvador	Reward	Stockwatering	1951	—	5	1,000.00
Saskatoon	Saskatoon	Storage Dam	1940	—	1,200	290,446.00
Sauder	Rush Lake	Storage & Irrigation	1949	—	800	29,115.00
Scotsguard	Scotsguard	Irrigation & Dam	1949	2,000	3,000	1,962.00
Scotsguard	Shaunavon	Stockwatering Dugout	1960	—	—	2,800.00
Scotsguard	Shaunavon	Stockwatering Dugout	1958	—	3	1,857.00
Shaheen	Rush Lake	Storage & Irrigation	1949	—	300	9,028.00
Shackleton, Village of	Shackleton	Dugout	1959	—	1.5	1,500.00
Shrimp Lake	Herschel	Stockwatering	1947	—	450	9,367.00
Sinfield	Kelvington	Multi-purpose Res.	1957	10	—	3,177.00
Skyeta, Com.	Springside	Dam	1959	—	15	3,885.00
Sioux Reserve	Fort Qu'Appelle	Stockwatering	1949	—	75	8,605.00
Sliding Hills Municipality	Veregin	Dugout	1960	—	—	1,000.00
Smiley, Village of	Smiley	Dugout	1949	—	1.5	1,000.00
Smiley	Smiley	Irrigation & Dam	1951	600	300	9,998.00
Snake Bite	Beechy	Irrigation	1954	665	—	9,999.00
Snipe Lake	Eston	Stockwatering	1949	—	—	3,415.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Snowdown Grazing Co-op.	Fox Valley	Dugout	1959	-	1.5	1,898.00
Souris-Estevan	Estevan	Irrigation	1941	-	-	91,133.00
Souris-Oxbow Weir	Oxbow	Stockwatering	1960	-	340	37,343.00
Souris River	Weyburn	Flood Control	1948	-	-	11,998.00
South Abernethy Project	Abernethy	Irrigation	1956	320	-	14,568.00
Spangler Project	Govenlock	Irrigation	1948	1,500	2,100	4,950.00
Stelcam Community Dam	Stelcam	Stockwatering	1956	-	360	9,791.00
Stephens Dam	Abernethy	Stockwatering	1948	-	12	8,716.00
Sturgis Community Dam	Sturgis	Stockwatering	1950	-	60	20,961.00
Summerberry	Summerberry	Multi-purpose Res.	1956	427	-	6,824.00
Summercove	Mankota	Irrigation & Dam	1949	1,200	1,500	23,837.00
Summit Creek	Bridgeford	Irrigation & Dam	1949	800	3,000	13,227.00
Sunbeam Creek	Indian Head	Multi-purpose Res.	1957	100	300	5,216.00
Swift Current	Swift Current	Irrigation	1946	30,000	95,000	816,472.00
Talmage	Cedoux	Irrigation	1948	1,600	-	3,483.00
Tantallon	Tantallon	Stockwatering Dam	1942	-	-	2,790.00
Tatagwa Lake	Weyburn	Flood Irrigation	1958	10,000	-	28,840.00
Terrell, R.M. of	Spring Valley	Stockwatering	1952	-	10	2,491.00
Thunder Creek	Kettlehut	Flood Irrigation	1948	-	-	27,204.00
Thunder Creek Channel	Moose Jaw	Irrigation & Dam	1951	300	7,000	10,007.00
Tilney	Tilney	Multi-purpose Res.	1958	-	100	8,308.00
Tribune Dam	Tribune	Stockwatering	1950	-	300	6,499.00
Truax	Truax	Stockwatering	1949	-	250	11,899.00
Tuxford	Tuxford	Flood Irrigation	1957	800	-	7,320.00
Twelve Mile Lake	Maxstone	Flood Irrigation	1956	-	-	7,998.00
Tyvan	Tyvan	Stockwatering	1947	-	1,000	11,986.00
Val Marie	Val Marie	Irrigation	1937	5,920	7,000	214,558.00
Val Marie West (including new Spillway 1959)	Val Marie	Irrigation	1940	4,230	2,000	321,586.00
Valeport Dyke	Valeport	Dam	1958	1,500	-	139,748.00
Valley Park Irrigation	Valley Lake	Irrigation	1949	1,200	-	8,133.00
Verwood	Verwood	Stockwatering Dam	1958	-	16	1,414.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Weed Creek	Broadview	Flood Irrigation	1958	2,000	-	3,099.00
West Osage	Cedoux	Irrigation & Dam	1949	300	600	4,905.00
West Poplar #1	Kildeer	Multi-purpose Res.	1957	750	1,000	16,230.00
Weyburn	Weyburn	Irrigation	1940	-	4,000	51,311.00
Wheatlands, R.M. of	Parkbeg	Irrigation & Dam	1951	100	60	3,452.00
White Gull Lake	Gull Lake	Flood Irrigation	1958	263	-	1,743.00
Wilson Lake	Lizard Lake	Multi-purpose Res.	1956	400	-	2,813.00
Wittrock	Hodgeville	Irrigation	1947	520	-	3,884.00
Wolseley	Wolseley	Stockwatering	1948	-	20	1,800.00
Wolverine Creek	Humboldt	Stockwatering Dam	1945	-	522	52,600.00
Wood Mountain	Willow Bunch	Irrigation & Dam	1951	40	60	6,337.00
Woodrow-Pinto Creek	Woodrow	Irrigation	1949	1,000	1,400	41,982.00
Wood River Development	Coderre and					
	Gravelbourg	Stockwatering Dam	1942	-	4,923	33,738.00
Wynn Community Project	Wolseley	Multi-purpose Res.	1957	500	-	3,152.00
Wynyard	Wynyard	Stockwatering	1947	-	35	6,225.00
Young	Young	Stockwatering	1948	-	250	8,892.00

x - Ultimate irrigation development for all projects along Qu'Appelle River Valley 30,000 - (total storage capacity - 95,600 acre feet).

ALBERTA

Acadia Valley	Acadia Valley	Dugout	1953	-	1.5	2,252.00
Acadia Valley #2	Acadia Valley	Dugout	1954	-	1.5	1,000.00
Aetna Irrigation District	Aetna	Irrigation	1947	8,000	-	82,004.00
Airdree	Calgary	Multi-purpose Res.	1958	-	200	9,789.00
Ambrose Flats	Irvine	Irrigation	1951	800	1,000	4,781.00
Anatole	Hanna	Stockwatering	1953	-	7	2,990.00
Antelope Park	Nemiscam	Stockwatering Dugout	1957	-	1.5	1,000.00
Argyle, M.D. of	Staveley	Stockwatering	1949	-	80	10,912.00
Atlee Gas Well #1	Atlee	Irrigation (pump)	1939	7,000	-	12,423.00
Atlee Gas Well #2	Atlee	Irrigation (pump)	1939	-	-	14,300.00
Atlee Buffalo	Atlee	Dugout	1959	-	9	7,200.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Badger Lake	Lomond	Stockwatering	1948	-	10	2,990.00
Bain Community	Foremost	Dugout	1959	-	10.5	6,800.00
Balzac	Balzac	Irrigation	1956	900	-	8,141.00
Bare Creek	Comrey	Irrigation & Dam	1950	-	500	11,600.00
Bare Creek #2	Comrey	Multi-purpose Dam	1956	1,000	1,100	13,029.00
Bartman Dam	Cessford	Irrigation	1943	1,000	3,000	49,100.00
Beautyland	Bindloss	Dugout	1959	-	6	1,500.00
Beauvais Lake	Pincher Creek	Irrigation	1950	2,000	2,400	15,996.00
Beaver Dam Creek Reservoir	Castor	Stockwatering	1950	-	300	17,996.00
Bedford Slough	Medicine Hat	Irrigation	Incomplete	3,000	200	35,493.00
Bell Lake	Pollockville	Irrigation	1949	700	1,500	4,738.00
Berry Creek	Carolside	Irrigation	1948	10,000	30,000	158,884.00
Bircham	Calgary	Flood Irrigation	1958	1,200	-	8,295.00
Bluefield Grazing Assoc.	Thelma	Stockwatering	1956	-	30	3,500.00
Blood Indian Reserve	Cardstone	Dugout	1960	-	-	2,079.00
Bowell	Bowell	Dugout	1954	-	1.5	1,000.00
Bow Island	Bow Island	Stockwatering Dam	1958	-	1.5	1,000.00
Bowmanton	Bowmanton	Stockwatering	1953	-	500	14,860.00
Brunswick Coulee	Enchant	Irrigation	1949	500	205	4,631.00
B.T. Grazing Co-op.	Hilda	Stockwatering	1956	-	3	1,000.00
Bull Pound Creek	Hanna	Stockwatering Dam	1939	-	2,000	-
Bullshead Creek	Medicine Hat	Irrigation	1940	800	1,130	8,170.00
Burke Creek	Claresholm	Stockwatering Dugout	1957	-	6	3,890.00
Burmis Creek	Burmis	Multi-purpose Res.	1957	550	250	14,683.00
Cameron	Youngstown	Multi-purpose Dam	1957	662	1,000	3,905.00
#Canada Land & Irrig. Project	Medicine Hat	Irrigation	1936	45,000	-	80,000.00
Caranova	Bowell	Multi-purpose Res.	1957	500	250	8,199.00
Carbon	Carbon	Multi-purpose Res.	1957	300	50	8,958.00
Champion	Champion	Irrigation	1954	2,500	-	4,984.00
Chipman Creek	Burmis	Flood Irrigation	1957	700	-	3,298.00
Clear Lake	High River	Stockwatering	1948	-	10,000	35,000.00
Collins	Sheerness	Stockwatering Res.	1956	-	40	3,495.00
Commodore	Vulcan	Irrigation	1954	400	-	3,990.00
Comrey Grazing	Comrey	Dugout	1953	-	1.5	1,000.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Conrich	West Calgary	Irrigation	1954	1,600	-	6,240.00
Consort	Hanna	Stockwatering	1955	-	20	9,651.00
Coutes Community Project	Coutes	Stockwatering Dam	1959	-	15	7,743.00
Cowley Community	Cowley	Irrigation	1952	750	-	4,666.00
Craigmyle	Craigmyle	Multi-purpose Dugout	1958	-	1.5	1,000.00
Cressday	Medicine Hat	Stockwatering	1954	-	-	13,541.00
Crowfoot	Gleichen	Multi-purpose Res.	1958	-	110	3,576.00
Cutbank Coulee	Cressday	Stockwatering Res.	1956	350	500	2,337.00
C.Y. Water Users	Taber	Stockwatering	1949	-	310	16,477.00
Cypress View	Irvine	Multi-purpose Res.	1958	-	300	11,336.00
D'Arcy	Hanna	Multi-purpose Res.	1957	-	15	2,116.00
Dead Fish Creek	Cessford	Irrigation	1949	4,000	5,000	47,832.00
Del Bonita	Twin River	Stockwatering	1955	-	250	9,196.00
Delia	Morrin	Stockwatering	1955	-	165	3,914.00
Drowning Ford	Vale	2 Dugouts & Dam	1953	-	100	4,368.00
East Berry Creek	Roselynn	Irrigation	1949	1,500	750	9,677.00
East Trout Creek	Stavely	Stockwatering Dam	1958	-	8	3,446.00
Eastern Irrigation District	Brooks	Irrigation	1937	2,280	22,000	22,490.00
Eastern Irrigation District (Antelope Coulee)	Brooks	Irrigation	Incomplete	-	-	35,793.00
Esler	Hanna	Stockwatering	1954	-	17	2,808.00
Esther Flood Irrigation	Macklin	Irrigation	1952	4,000	5,000	4,592.00
Eureka Irrigation Project	Grassy Lake	Irrigation	1949	12,000	1,000	38,568.00
Fenn	Stettler	Stockwatering Dam	1959	-	35	1,400.00
Fish Lake	Pincher Creek	Irrigation & Dam	1954	1,000	-	6,895.00
Franklin Coulee	Retlaw	Stockwatering	1948	-	1,500	20,125.00
Garden Plains	Sponden	Stockwatering Dugout	1956	-	6	1,596.00
Graham Creek	Calgary	Stockwatering Dam	1943	-	230	8,529.00
Granlea Community	Granlea	Stockwatering Dam	1959	-	725	12,853.00
Grainger	Three Hills	Multi-purpose Res.	1956	30	117	9,482.00
Greasewood Coulee	Manyberries	Irrigation & Dam	1954	500	650	9,798.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Halkirk Com.	Halkirk	Irrigation	Incomplete	303	-	2,637.00
Hampton	Youngstown	Multi-purpose Res.	1957	2,000	401	8,000.00
Hanna	Hanna	Stockwatering	1948	-	500	29,498.00
Hays	Hays	Dugout	1960	-	-	4,500.00
Heath Creek	Northfork	Stockwatering Dam	1958	-	12	3,848.00
Hilda Community Project	Hilda	Multi-purpose Dugout	1957	-	10	5,180.00
Huber Dam	Castor	Stockwatering Dam	1959	-	112	3,068.00
Illingsworth	Bow Island	Dugout	1954	-	1.5	1,000.00
Indian Farm Creek	Pincher Creek	Irrigation & Dam	1953	600	500	4,795.00
Indus Community Project	Conrich	Irrigation	1955	1,220	-	9,843.00
Irvine	Irvine	Irrigation & Dam	1950	70	100	4,799.00
Irvine	Irvine	Multi-purpose Res.	1960	-	15	4,714.00
Jaydot	Elkwater	Multi-purpose Res.	1956	300	400	8,988.00
Kathryn	Calgary	Irrigation & Dam	1954	300	-	9,184.00
Lake Valley	Bowell	Stockwatering Dugout	1957	-	1.5	1,000.00
#Leavitt Irrigation	Mountain View	Irrigation	1939	7,000	7,050	65,578.00
Lewis	Vulcan	Irrigation & Dam	1953	350	-	4,345.00
Lochend Lake	Calgary	Dam & Irrigation	1958	1,600	1,100	7,750.00
Lomand	Lomand	Dugout	1959	-	3	1,000.00
Loveland	Hanna	Irrigation	1954	3,000	-	17,655.00
Loyalist Creek	Hanna	Irrigation	1950	2,000	1,400	14,993.00
Lundbreck	Pincher Creek	Stockwatering	1953	-	100	4,689.00
McArthur	Walsh	Dam	1959	-	700	14,565.00
McAlpine Reservoir	Walsh	Irrigation	1951	600	1,000	15,917.00
McGregor Dam	Vulcan	Irrigation	1951	1,500	700	9,473.00
McLaren	Michichi	Multi-purpose Res.	1957	150	660	13,815.00
Mackay Dam	Walsh	Irrigation	1952	600	300	9,600.00
#Magrath	Magrath	Irrigation	1939	4,000	-	2,756.00
Meadow Creek Dam	Claresholm	Irrigation	1952	1,500	-	5,630.00
Mekastoe	Fort MacLeod	Dam	1959	-	210	4,594.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Michelle Creek Project	Thelma	Multi-purpose Res.	1959	-	800	14,791.00
Milk River	Milk River	Dugout	1960	-	-	4,448.00
Milne Community Project	Conrich	Irrigation	1955	1,300	-	9,644.00
Mountain View	Mountain View	Storage Dam	1936	-	4,200	3,000.00
Naismith	Youngstown	Multi-purpose Res.	1956	300	145	9,421.00
Nemiscam	Etzikom	Dugout	1954	-	1.5	1,000.00
Nester	Cessford	Multi-purpose Res.	1957	300	1,350	8,670.00
New Brigden	Hanna	Stockwatering Dam	1958	-	60	3,582.00
Nobleford Water Users	Nobleford	2 Dugouts	1953	-	3	11,173.00
North Fincastle	Taber	Irrigation & Dam	1948	2,000	4,000	17,943.00
Osburne Water Conservation	Iddesleigh	Dam	1959	-	210	9,495.00
Oyen	Oyen	Stockwatering Dugout	1957	-	1.5	1,000.00
Parfles	Chancellor	Irrigation	1954	250	-	4,730.00
Peace Butte Reservoir	Peace Butte	Stockwatering	1955	450	550	8,993.00
Pershing Dam	Glenwood	Irrigation	1951	100	200	4,782.00
Pirmez Creek	Pirmez Creek	Irrigation	1951	6,000	500	20,998.00
Porcupine Hills	Fort MacLeod	Dugout	1959	-	1.5	4,599.00
Porcupine Hills Stock Assoc.	Fort MacLeod	Dugout	1960	-	-	1,868.00
Pothole Coulee	Magrath	Irrigation	1948	Part of St. Mary Project		
Priddis	High River	Stockwatering	1955	-	312	8,802.00
Provost, Village of	Provost	Multi-purpose Dam	1956	-	3	4,812.00
Ranchville Community Res.	Ranchville	Irrigation	1957	300	-	4,950.00
#Raymond	Raymond	Irrigation	1943	3,000	1,600	6,000.00
Reid Hill	Vulcan	Irrigation	1952	1,000	700	8,866.00
Remount	Bindloss	Dugout	1960	-	-	3,000.00
Rock Creek Stock Assoc.	Sandbreck	Stockwatering Dugout	Incomplete	-	-	1,819.00
Rock Lake Project	Brooks	Irrigation	1957	11,000	-	133,984.00
#Rolling Hills	Rolling Hills	Irrigation	1938	25,000	-	46,839.00
Rose Glen Water Users	Schuler	Multi-purpose Dam	1957	200	150	6,884.00
Ross Creek	Irvine	Irrigation	1950	3,000	5,000	47,998.00
Ross Lake Community	Raymond	Stockwatering	1950	-	300	7,987.00



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Rough Meadow Reservoir Ruks	Coronation Pincher Creek	Irrigation Irrigation & Dam	1951 1954	200 900	- 250	2,471.00 6,484.00
Schuler Water Users	Schuler	Multi-purpose Res.	1957	-	5	5,443.00
Serviceberry Creek	near Drumheller	Irrigation	1949	1,200	500	17,518.00
Seven Persons	Seven Persons	Stockwatering Dam	1943	-	800	12,103.00
Severn Creek	Rosebud	Irrigation & Dam	1950	1,000	1,000	24,990.00
Sheerness Grazing (Blois)	Roselynn	Stockwatering	1953	-	12	3,797.00
Sheerness #2	Roselynn	Stockwatering	1954	-	50	2,190.00
Snake Creek	Calgary	Irrigation & Dam	1950	500	300	15,976.00
Spondin	Hanna	Dugout	1955	-	1.5	1,000.00
Spruce Coulee	Elkwater	Stockwatering Dam	1959	-	1,000	12,496.00
Spruce Co-op.	Parkland	Stockwatering Dugout	1960	-	-	3,529.00
Starland, M.D. of	Morrin	Stockwatering	1956	-	45	3,196.00
Stehr Coulee	Walsh	Multi-purpose Res.	1956	-	26	4,570.00
Sounding Creek	Cereal	Irrigation	1949	8,000	5,600	51,988.00
South MacLeod	MacLeod	Irrigation	1948	6,000	-	82,614.00
Squaw Coulee	High River	Irrigation	1949	2,000	455	17,999.00
Sundial	Champion	Dugout	1959	-	6	3,102.00
Swalwell	Swalwell	Multi-purpose Res.	1957	280	300	9,463.00
Three Hills	Three Hills	Stockwatering	1948	-	120	19,652.00
Twin Lakes	Chancellor	Irrigation	1954	500	-	12,498.00
Twin River Grazing	Twin River	Stockwatering	1953	-	125	4,486.00
Two Lakes	Elkwater	Multi-purpose Res.	1958	1,500	1,900	14,378.00
Vulcan Dam	Vulcan	Irrigation	1951	400	150	3,997.00
Vauxhall	Vauxhall	Stockwatering	1948	-	30	5,883.00
Waddington	Vale	Multi-purpose Res.	1957	-	12	2,904.00
Walsh Flats	Walsh	Irrigation	1953	2,100	25,000	4,700.00
Watts Flats	Watts	Flood Irrigation	1958	2,000	-	6,147.00
(Bull Pound-Lone Butte)	Claresholm	Dugout	1960	-	-	2,263.00
West Trout Creek	Rockyford	Irrigation	1952	-	-	4,744.00
Wheatacre #2						

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Wheatacre Dam	Rockyford	Irrigation	1950	1,600	1,500	12,976.00
Wild Horse Storage	Cressday	Irrigation	1936	3,600	4,500	24,370.00
Wintering Hills	Hussar	Irrigation	1950	1,000	500	9,993.00
Wisdom Water Users	Medicine Hat	Multi-purpose Res.	1957	420	500	14,403.00
Woolford Community Project	Cardston	Irrigation	1955	400	-	3,593.00
Writing on Stone	Milk River	Dugout	1959	-	6	8,291.00
Yeast Reservoir	Thelma	Irrigation	1953	400	800	6,592.00

# - P.F.R.A. gave assistance to a project already in existence to improve storage capacities, canals and distribution systems.



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Rough Meadow Reservoir Ruks	Coronation Pincher Creek	Irrigation Irrigation & Dam	1951 1954	200 900	- 250	2,471.00 6,484.00
Schuler Water Users	Schuler	Multi-purpose Res.	1957	-	5	5,443.00
Serviceberry Creek	near Drumheller	Irrigation	1949	1,200	500	17,518.00
Seven Persons	Seven Persons	Stockwatering Dam	1943	-	800	12,103.00
Severn Creek	Rosebud	Irrigation & Dam	1950	1,000	1,000	24,990.00
Sheerness Grazing (Blois)	Roselynn	Stockwatering	1953	-	12	3,797.00
Sheerness #2	Roselynn	Stockwatering	1954	-	50	2,190.00
Snake Creek	Calgary	Irrigation & Dam	1950	500	300	15,976.00
Spondin	Hanna	Dugout	1955	-	1.5	1,000.00
Spruce Coulee	Elkwater	Stockwatering Dam	1959	-	1,000	12,496.00
Spruce Co-op.	Parkland	Stockwatering Dugout	1960	-	-	3,529.00
Starland, M.D. of	Morrin	Stockwatering	1956	-	45	3,196.00
Stehr Coulee	Walsh	Multi-purpose Res.	1956	-	26	4,570.00
Sounding Creek	Cereal	Irrigation	1949	8,000	5,600	51,988.00
South MacLeod	MacLeod	Irrigation	1948	6,000	-	82,614.00
Squaw Coulee	High River	Irrigation	1949	2,000	455	17,999.00
Sundial	Champion	Dugout	1959	-	6	3,102.00
Swalwell	Swalwell	Multi-purpose Res.	1957	280	300	9,463.00
Three Hills	Three Hills	Stockwatering	1948	-	120	19,652.00
Twin Lakes	Chancellor	Irrigation	1954	500	-	12,498.00
Twin River Grazing	Twin River	Stockwatering	1953	-	125	4,486.00
Two Lakes	Elkwater	Multi-purpose Res.	1958	1,500	1,900	14,378.00
Vulcan Dam	Vulcan	Irrigation	1951	400	150	3,997.00
Vauxhall	Vauxhall	Stockwatering	1948	-	30	5,883.00
Waddington	Vale	Multi-purpose Res.	1957	-	12	2,904.00
Walsh Flats	Walsh	Irrigation	1953	2,100	25,000	4,700.00
Watts Flats	Watts	Flood Irrigation	1958	2,000	-	6,147.00
(Bull Pound-Lone Butte)	Claresholm	Dugout	1960	-	-	2,263.00
West Trout Creek	Rockyford	Irrigation	1952	-	-	4,744.00

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Wheatacre Dam	Rockyford	Irrigation	1950	1,600	1,500	12,976.00
Wild Horse Storage	Cressday	Irrigation	1936	3,600	4,500	24,370.00
Wintering Hills	Hussar	Irrigation	1950	1,000	500	9,993.00
Wisdom Water Users	Medicine Hat	Multi-purpose Res.	1957	420	500	14,403.00
Woolford Community Project	Cardston	Irrigation	1955	400	-	3,593.00
Writing on Stone	Milk River	Dugout	1959	-	6	8,291.00
Yeast Reservoir	Thelma	Irrigation	1953	400	800	6,592.00

# - P.F.R.A. gave assistance to a project already in existence to improve storage capacities, canals and distribution systems.



APPENDIX V  
CUMULATIVE STATEMENT  
Development and Operation of Community Pastures under the  
Prairie Farm Rehabilitation Act  
1938 to March 31, 1961

Fiscal Year	No. of Pasture Units in Opera- tion	Area of Land in Pastures (acres)	Total Cost of Construction of Pastures \$	X Acres per Unit of Live- stock		Cost of Operation		Net Opera- ting cost per Unit of Livestock \$	Average Charge per Unit Live- stock to Farmers \$
				Livestock Units Carried on Pastures		Revenue \$	Operating Costs \$		
1938-39	14	189,800	165,995.03	3,231	58.7	6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1	21,632.71	20,945.84	1.82	1.88
1940-41	35	884,500	1,004,305.91	23,245	38.1	43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2	65,434.89	50,607.22	1.52	1.97
1942-43	45	1,261,100	1,129,487.54	51,127	24.7	98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3	111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,699,012.21	59,997	22.3	151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1	167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6	198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4	203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1	204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5	211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1	221,129.45	217,867.15	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4	335,327.16	237,742.13	3.08	4.34
1952-53	59	1,652,020	3,754,098.41	94,137	17.5	438,513.75	373,737.36	3.97	4.66
1953-54	60	1,678,736	3,963,572.83	109,583	15.3	507,179.14	490,807.89	4.48	4.55
1954-55	60	1,696,900	4,273,916.79	106,322	15.9	496,805.78	466,153.69	4.38	4.66
1955-56	60	1,728,700	4,509,668.59	108,499	15.8	499,045.13	501,540.73	4.67	4.60
1956-57	61	1,759,570	4,832,863.47	117,441	14.9	548,601.01	508,002.83	4.33	4.67
1957-58	61	1,796,275	5,119,317.01	119,398	15.0	552,938.40	607,129.23	5.08	4.63
1958-59	62	1,815,265	5,509,958.43	117,032	15.5	542,606.90	686,448.88	5.87	4.64
1959-60	64	1,818,464	5,800,342.43	124,812	14.6	705,785.32	742,915.21	5.95	5.65
1960-61	65	1,896,173	6,254,224.42	122,813	15.4	656,708.97	879,811.85	7.15	5.35
						6,987,052.91	6,924,945.07		

x — A livestock unit indicates one head of cattle, one horse, or five sheep.

A pasture unit may include one or more pastures, but it is operated under one management.

# APPENDIX VI

## P.F.R.A. COMMUNITY PASTURES IN OPERATION DURING THE FISCAL YEAR ENDED MARCH 31, 1961

Community Pasture & Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1960	Accumulated Cost of Construction March 31, 1961	1960-1961	
				Cattle	Horses
SASKATCHEWAN					
Pasture Units					
Coalfields #4, North Portal	32,860	163,997.39	168,350.39	3155	69
Estevan Cambria #5-6, Macoun	6,720	18,856.56	20,196.57	272	9
Masefield #17, Orkney	36,320	115,431.66	116,697.63	1691	-
Lone Tree #18, Bracken	33,600	96,816.71	100,350.71	1363	-
Battle Creek #20, Divide	69,920	165,363.82	169,123.89	2997	-
Nashlyn, #21, Consul	61,520	92,704.07	97,211.43	2470	4
Govenlock #22, Govenlock	68,800	113,034.45	118,191.72	2096	2
Lomond #37, Pasture #1, Goodwater	23,360	86,149.83	91,750.96	2447	33
Lomond #37, Pasture #3, Maxim	18,400	83,139.62	84,741.93	1465	22
Laurier #38, Lomond #37 - #2, Radville	37,175	108,999.43	113,128.19	2852	67
The Gap #39, Ceylon	13,920	88,258.98	90,718.80	1250	26
Val Marie #47, Pasture #1, Val Marie	110,000	276,438.53	280,003.90	5529	2
Val Marie-Beaver Valley #47A					
Pasture #2, Cadillac	57,680	25,810.86	57,203.67	2852	23
Reno #51, Pasture #1, Robsart	17,120	63,533.54	63,533.54	1108	7
Reno #51, Pasture #2, Consul	11,360	29,877.83	29,877.83	626	-
Tecumseh #65, Forget	18,400	80,867.55	82,558.52	1831	20
Brokenshell #68, Pasture #1, Yellow Grass	22,720	101,634.48	107,794.02	1695	58
Brokenshell #68, Pasture #2, Weyburn	8,160	16,060.94	16,651.04	348	1
Excel #71, Ormiston	20,500	71,620.87	79,670.48	1814	-
Key West #70, Kayville	10,240	35,019.95	38,428.53	1007	4
Auvergne Wise Creek #76-77, Cadillac	42,880	140,908.90	149,257.05	3437	-
Wellington #97, Tyvan	25,360	112,798.36	118,817.95	2672	51
Caledonia-Elmsthorpe #99-100, Milestone	26,400	119,105.66	120,757.03	1621	45
Shamrock #134, Shamrock	26,080	87,126.19	87,147.26	1408	-
Swift Current-Webb #137-8, Swift Current	18,720	83,526.75	83,756.75	1573	-
Gull Lake #139, Tompkins	10,720	32,362.21	34,490.60	634	-
Big Stick #141, Maple Creek	21,860	45,456.24	46,863.40	1361	-



# APPENDIX VII

## MAJOR PROJECTS - IRRIGATION, RECLAMATION AND WATER STORAGE

(Projects by Special Votes of Parliament, Administered by P.F.R.A. to March 31, 1961)

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
MANITOBA						
Assiniboine River Diking & Cut Off	Brandon	River Control	Incomplete	-	-	1,091,505.00
North-West Escarpment Reclamation Proj.-Riding Mt. Area	Dauphin	Watershed Control	Incomplete	-	-	1,059,700.00
Fairford River Project	Lake Manitoba	Flood Control	1960	-	-	112,316.00
Saskatchewan River Reclamation - Pasquia Area	The Pas	Reclamation	Incomplete	135,000	-	2,243,069.00
ALBERTA						
Bow River	Medicine Hat	Irrigation	Incomplete	235,000	408,862	54,398.00
(a) Purchase of Canada Land & Irrigation Company						2,353,182.00
(b) Development & Construction						20,960,498.00
St. Mary	Lethbridge	Irrigation	Incomplete	510,000	320,000	14,602,869.00
Belly River Diversion	Lethbridge	Irrigation	1950	-	-	53,901.00
BRITISH COLUMBIA						
Cawston Benches	Keremeos	Irrigation (pump)	1951	629	2,000	185,491.00
Chase & Johnston - Western Canada Ranching	Kamloops	Irrigation	1951	755	-	98,243.00
Western Canada Ranching #2	Kamloops	Irrigation (pump)	1950	54	-	58,069.00
Lillooet - Pemberton	Pemberton	River Control	1953	-	-	1,056,539.00
South Thompson - Niskonlith Gravity Project	Kamloops	Irrigation	Incomplete	1,030	1,200	12,282.00
Westbank Project	Kelowna	Irrigation	1950	1,200	2,500	537,450.00
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	-	32,229.00
Penticton West Bench	Penticton	Irrigation (pump)	1953	800	-	66,362.00
B.C. Fruitlands	Kamloops	Irrigation	Incomplete	2,000	-	200,000.00

(Above includes ONLY Construction Costs)

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
SASKATCHEWAN						
South Saskatchewan River Project	Outlook	Multi-purpose	Incomplete	500,000 (Including 24,000 in Qu'Appelle extension)	-	16,657,378.00
Buffalo Pound Project	Qu'Appelle Valley	Urban Water Supply	1960	-	42,000	2,111,799.00
- Eyebrow Lake Diversion	Eyebrow	Water Supply	1960	-	-	98,376.00
(Above includes ONLY Construction Costs)						



APPENDIX VIII  
PRAIRIE FARM REHABILITATION ACT – EXPENDITURES BY ACTIVITIES  
April 1, 1935 – March 31, 1961

ADMINISTRATION

Ottawa and Regina Administration	\$ 2,443,129
Engineering Services – Surveys, Design, Soil Mechanics, Drainage Studies, Legal Surveys, Supervision of Construction	18,799,766

LAND UTILIZATION

Cultural work – Soil Drifting, etc. (Exp. Farm Service)	4,966,394
Community Pastures – Construction, Operation & Maintenance Movement of Settlers	19,596,592 227,841

WATER DEVELOPMENT

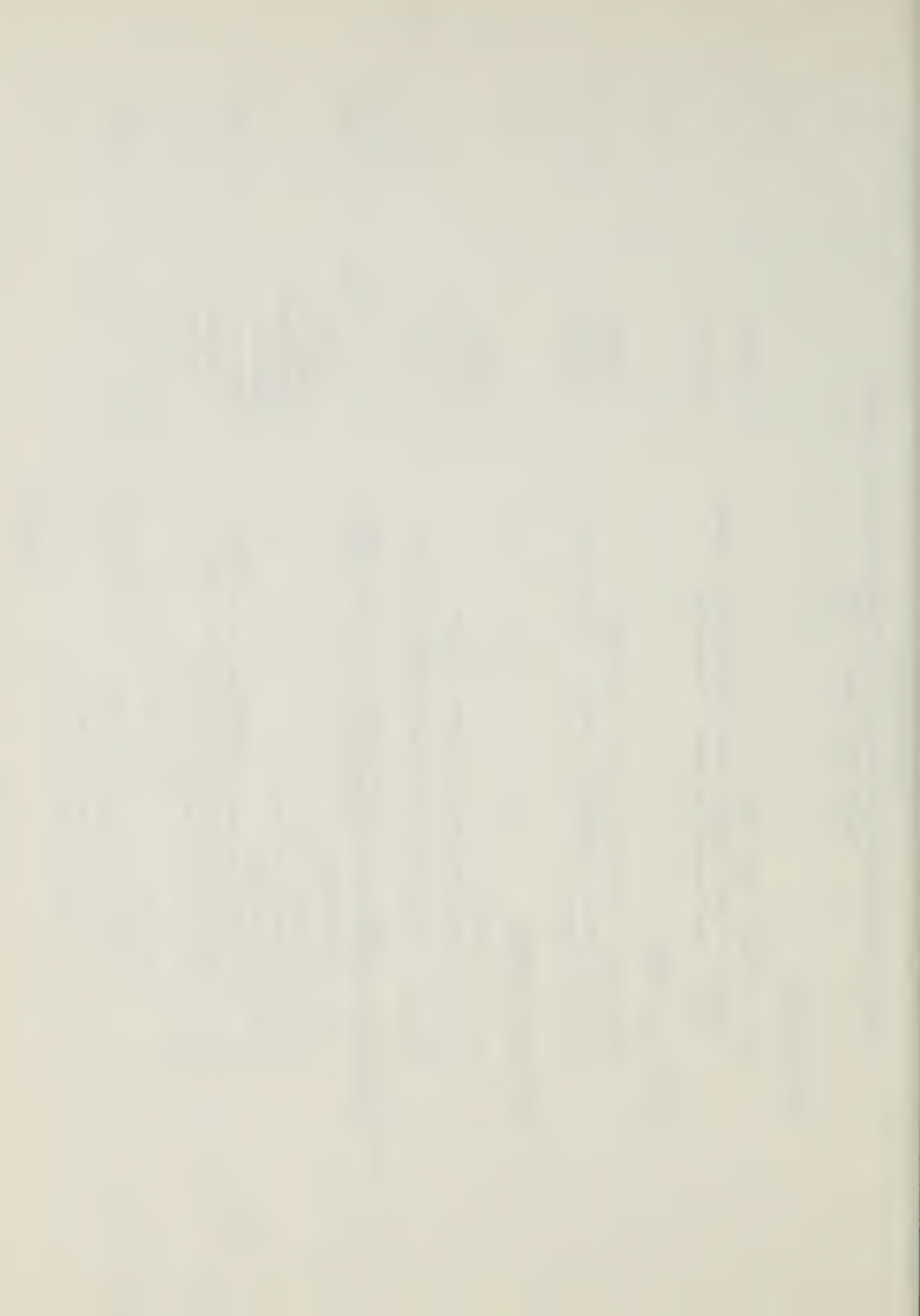
Small Farm Projects	21,116,107
Community, Large Water Storage & Irrigation Projects Supervision	18,143,842 2,970,273
Equipment – Purchase and Repairs, Service Depot	6,776,272

MAJOR PROJECTS, IRRIGATION, RECLAMATION & CONSERVATION

St. Mary's Irrigation Project	21,797,009
Bow River Irrigation Project	29,377,408
South Saskatchewan River Project	23,855,969
Assiniboine River Dyking	1,254,635
B.C. Reclamation & Development, incl. Lillooet Project	3,310,182
Land Protection & Reclamation, Manitoba & Eastern Canada	3,568,862
Miscellaneous Projects – Construction	3,999,036
	<hr/>
	\$ 182,203,317

REVENUE:

Community Pasture Operations	\$ 7,472,063
Irrigation Project Operation & General Revenue	3,637,230
	<hr/>
	\$ 11,109,293





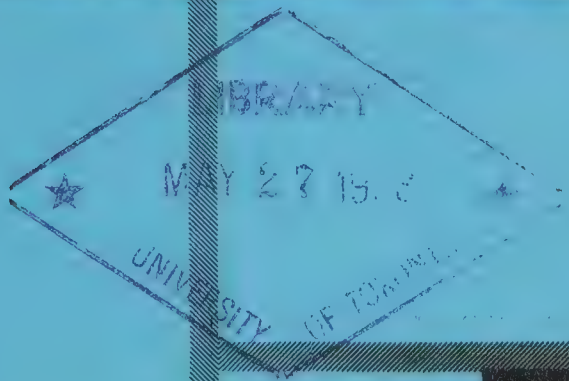
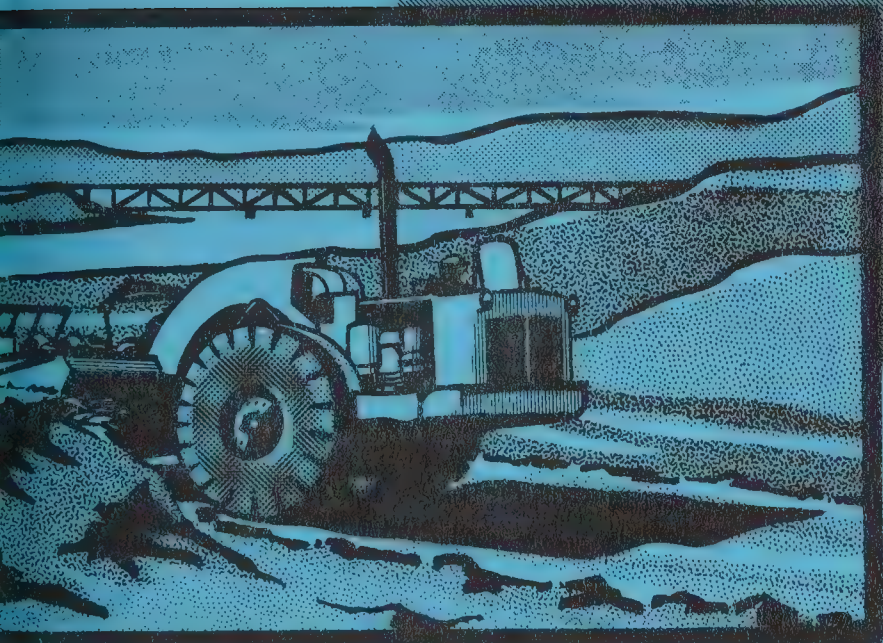


ROGER DUHAMEL, F.R.S.C.  
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY  
OTTAWA, 1962



Doc  
Canada Department of Agriculture  
Farm Rehabilitation Annual

AI DA 20  
A56



# Annual Report

on prairie farm rehabilitation  
and related activities

1961  
1962

CANADA DEPARTMENT OF AGRICULTURE







**ANNUAL REPORT**  
**PRAIRIE FARM REHABILITATION**  
**and RELATED ACTIVITIES**  
**1961 - 62**





# TABLE OF CONTENTS

	Page
<b>INTRODUCTION .....</b>	
<b>ADMINISTRATION and ORGANIZATION .....</b>	
<b>ADMINISTRATIVE SERVICES BRANCH .....</b>	1
Information Division .....	1
Land Division .....	2
<b>CONSTRUCTION, EQUIPMENT and SUPPLY DIVISION .....</b>	5
<b>WATER DEVELOPMENT PROGRAM .....</b>	7
Farm and Community Projects .....	7
Large Water Development Projects .....	9
LaSalle River Dams .....	10
Perry Park Dam .....	10
Plumas Dam .....	10
Deloraine Dam .....	10
Boissevain Water Storage Project .....	10
Oungre Community Project .....	11
Birch Hills Community Storage Project .....	11
Cleland Dam .....	11
Antler Creek Project (Carnduff Dam) .....	12
West Poplar River Development Conservation Reservoir No. 1 .....	12
Nashlyn Irrigation Project .....	13
Parr-Castor Project .....	13
Technical Assistance .....	14
<b>COMMUNITY PASTURE PROGRAM .....</b>	16
Pasture Operations .....	16
Pasture Services .....	18
Haying and Regrassing .....	19
Fires and Fire Protection .....	20
Grasshopper Control .....	20
Breeding Service .....	20
Livestock Losses .....	20
Livestock Insurance .....	21
Pasture Construction .....	21
Pasture Improvement .....	22
<b>REHABILITATION and RESETTLEMENT .....</b>	24
<b>MAJOR IRRIGATION and RECLAMATION PROJECTS .....</b>	27
St. Mary Irrigation Project .....	27

# TABLE OF CONTENTS (continued)

	Page
Engineering and Construction .....	28
Operation and Maintenance .....	29
Agricultural Development .....	29
Recreation .....	29
Bow River Irrigation Project .....	29
Construction .....	31
Operation and Maintenance .....	31
Agricultural Development .....	32
South Saskatchewan River Project .....	33
General .....	33
Design and Planning .....	34
Construction Activities .....	34
Public Relations .....	36
Pre-development Farm .....	36
Buffalo Pound Lake Water Supply Project .....	38
Assiniboine River Project .....	39
Northwest Escarpment and Interlake Reclamation Project .....	40
ENGINEERING SERVICES .....	42
Design Division .....	42
Drafting Section .....	42
Air Photo Analysis and Engineering Geology Division .....	42
Soil Mechanics and Materials Division .....	44
Hydrology Division .....	45
Surveys .....	46
APPENDICES .....	48
Appendix I	
Water Development Program — Progress by Years in the Construction of Individual, Neighbor and Community Projects .....	48
Appendix II	
Water Development Program — Number of Individual, Neighbor, Community and Large Water Development Projects and amount of financial assistance paid from April 1, 1961 to March 31, 1962 .....	49
Appendix III	
Water Development Program — Number of Individual, Neighbor, Community and Large Water Development Projects and amount of financial assistance paid from April 1, 1935 to March 31, 1962 .....	50
Appendix IV	
Community Water Storage and Irrigation Projects to March 31, 1962 .....	51



## TABLE OF CONTENTS (continued)

Page

### APPENDICES (continued)

#### Appendix V

Cumulative Statement – Development and Operation of Community  
Pastures under the Prairie Farm Rehabilitation Act  
1938 to March 31, 1962 .....

70

#### Appendix VI

P.F.R.A. Community Pastures in Operation During the  
Fiscal Year Ended March 31, 1962 .....

71

#### Appendix VII

Major Projects – Irrigation, Reclamation and Water Storage  
to March 31, 1962 .....

74

#### Appendix VIII

PFRA Expenditures by Activities  
April 1, 1935 to March 31, 1962 .....

76

# PLANS

	Plate Number
Small Water Projects .....	I
Community Pastures .....	II
St. Mary River Project .....	III
Bow River Project .....	IV
Existing and Proposed Control Works Assiniboine River .....	V



## INTRODUCTION

The Prairie Farm Rehabilitation Act was passed by the Parliament of Canada in 1935 to provide for the rehabilitation of drouth and soil drifting areas of Manitoba, Saskatchewan and Alberta. In 1937 the Act was amended to include land utilization and resettlement and by further amendment in 1939, it was extended to remain in force indefinitely.

As originally conceived, assistance under the Act mainly concerned activities centering around the conservation and reclamation of land and water resources throughout the southern plains area of the three Prairie Provinces. In more recent years, however, P.F.R.A. has also been made responsible for the development of large-scale irrigation and reclamation projects in Western Canada, and in 1961, the boundaries of P.F.R.A. were extended to provide assistance in the field of soil and water conservation to all agricultural areas within the three Prairie Provinces.

The following report presents a review of activities carried out by the Prairie Farm Rehabilitation Administration during 1961.





## ADMINISTRATION and ORGANIZATION

The Prairie Farm Rehabilitation Act is administered by a Director who is responsible to the Deputy Minister of Agriculture in Ottawa. The headquarters of the Organization is located at Regina and consists of three main branches; Administrative Services, Agricultural Services and Engineering Services. In addition, there are a Legal Division and a Construction, Equipment and Supply Division, both directly responsible to the Director.

The Administrative Services Branch consists of units providing financial, personnel and office services, as well as an Information Division and a Lands Division.

The Agricultural Services Branch is responsible for all activities associated with the development of farm and community water storage and irrigation projects, and the development and operation of community pastures. Seventeen district offices of the Branch are strategically located throughout the Prairie Provinces to provide advice and assistance to individual farmers. For supervisory and administrative purposes the 70 pastures operated by the Branch are divided into five areas each with a supervisor responsible for pasture operations in his area.

The Engineering Services Branch is responsible for design, soil mechanics investigations, hydraulic, hydrology and air photo analysis and engineering geology studies, as well as all legal and engineering surveys required in the planning of P.F.R.A. projects. Field engineering services are carried out by the Branch through three regional offices located at Regina, Calgary and Winnipeg.





## ADMINISTRATIVE SERVICES BRANCH

The Administrative Services Branch supervises the program of the Information Division, co-ordinates the activities of the Land Division, and assumes overall responsibility for the administrative management of the organization in accordance with various acts, regulations and departmental policies. Two of its major responsibilities concern financial and personnel management. The former includes estimating costs, controlling expenditure and accounting; the latter concerns selection, classification, establishment control and other aspects of personnel management. Office services such as the provision of office equipment and supplies, accommodation, security, inventory maintenance, and a central file registry are also provided for headquarters, regional and district offices.

### Information Division

Activities of the Information Division are covered under three general headings; information, photography and library services.

The information section of the Division prepares reports, publications and articles on P.F.R.A. activities required by the Organization for documentary and public distribution purposes. In addition, this section has become increasingly involved in publicity and public relations activities in the press, radio and TV fields. During 1961 a total of 67 news stories were produced along with six radio tapes and 12 short TV films covering 1,900 newspaper, radio and TV outlets across the three Prairie Provinces.



PFRA display shown at Class "A" and "B" fairs in western Canada.



Publications produced by the Division during 1961 included the P.F.R.A. Annual Report, reports on P.F.R.A. activities for the Annual Report of the Minister of Agriculture and the Canada Year Book, and several brochures and special publications, namely;

- P.F.R.A. - The Story of Conservation on the Prairies
- Progress of Construction - South Saskatchewan River Dam
- Community Pasture Program
- PFRA Water Development Program
- St. Mary Irrigation Project
- Rivers Dam

The section also helped prepare a short brochure on the P.F.R.A. Water Development Program published by the departmental Information Division in Ottawa. Responsibility for the distribution of the above mentioned pamphlets was assumed by the Information Division.

On displays, a fairly extensive program was carried out by the Division during the year. This consisted mainly of setting up and manning two complete displays on P.F.R.A. activities used on the Class "A" and "B" fair circuits throughout the three Prairie Provinces, and constructing three permanent public displays of the South Saskatchewan River Project - two in Saskatoon and one in Regina.

The Photo Section provides photographic services to all branches and divisions of P.F.R.A. and maintains a complete record of photographs in the section for documentary and publicity purposes. During 1961, a total of 4,000 photographs were taken and approximately 45,000 prints produced. Approximately 9,000 feet of black and white movie film and 3,100 feet of color movie film were shot and edited during the year.

Library services are also extended to all branches and divisions of P.F.R.A. including eight field libraries affiliated with the main P.F.R.A. library in Regina. Total accessions processed through the Regina library during 1961 amounted to 663 of which 450 were purchased. Also handled by the library was the circulation of 154 periodical publications to P.F.R.A. headquarters and field offices - 141 were obtained on direct P.F.R.A. subscription and 13 through a loaning arrangement with Ottawa.

#### Land Division

The Land Division is responsible for the acquisition of all land required for P.F.R.A. projects and the administrative management of lands under P.F.R.A. control. These include land acquired or held for soil and water conservation, reclamation and dyking programs. In its work the Land Division works closely with the Legal Division, provincial departments and other public and private agencies.

The major work of the Division involves the appraisal of land for purchase, flood easements, exchange, assessing damage claims, leasing and other purposes associated with P.F.R.A. projects involving land control.



The Land Division also maintains a record of titles, leases and permits, for land held by P.F.R.A. on behalf of Canada.

As of March 31, 1962, this Division was responsible for the following acreages:

Water Conservation and Reclamation Projects

Saskatchewan	30,553.32 acres	
Manitoba	<u>5,336.87</u> "	35,890.19

Community Pastures (titles and leases)

Saskatchewan	1,575,474.55 acres	
Manitoba	<u>284,045.38</u> "	1,859,519.93

Major Irrigation Projects

St. Mary	13,993.87 acres	
Bow River	110,624.80 "	
South Sask. River	<u>52,031.47</u> "	176,650.14

Minor Irrigation Projects

Swift Current	16,075.75 acres	
Val Marie	16,450.07 "	
Maple Creek	<u>11,412.40</u> "	<u>43,938.22</u>

TOTAL ACREAGE 2,115,998.48

The cost of land acquired during the fiscal year 1961-62 amounted to \$606,430.44.





## CONSTRUCTION, EQUIPMENT and SUPPLY DIVISION

This Division services the diversified activities of other branches of P.F.R.A. Facilities are maintained for repairing equipment and works, and experienced personnel are available for construction and maintenance programs on development projects throughout the P.F.R.A. area.

A wide variety of services were again provided by the Division during 1961. Eighty-four persons were on regular staff and casual help was hired as required. On repair work in the Moose Jaw Trades Shops, 620 jobs were reported: 242 items of work on vehicles, 65 on trailers and 313 on units of mechanical equipment. Also undertaken in the trades shops was the manufacture of over 450 items of equipment including camp trailers, water and feed troughs, concrete forms and hardware.

Field construction crews worked on 128 different projects during the year, including the repair, maintenance and construction of P.F.R.A. water development structures, fireguarding in community pastures, painting buildings and structures, and servicing plumbing, heating and electrical equipment. Transporting equipment and supplies for various operations required 760 separate trips (185,181 miles of travel).

In the purchasing section, the total volume of goods handled amounted to approximately \$500,000. Equipment purchased generally involved the routine replacement of special equipment required for the operation and maintenance of projects. The major item of new equipment was the acquisition of six high head portable pumping units with over 30,000 lineal feet of 6-inch aluminum irrigation pipe and the necessary trailers required for the emergency dugout pumping program. Vehicle replacements were normal although a number of cars used by field personnel are being replaced with more functional models.

The fire prevention and safety program initiated several years ago was also continued, and loss from preventable fires was very low, as were the number and severity of accidents to personnel. In co-operation with the Workmen's Compensation Board, an advanced First Aid Course was conducted at Moose Jaw for supervisors of the field and shop staff. Nearly all the field foremen and supervisors now have first-aid proficiency certificates, and a good training in general safety programs.



Farm dugout being filled with water from melting snow collected from an adjacent shelterbelt of trees.

Ref. No. 22816



Mid-summer on same farm showing dugout filled to capacity.

Ref. No. 23079



## WATER DEVELOPMENT PROGRAM

One of the primary provisions of the Act, which was established in 1935, was to provide engineering and financial assistance for the construction of farm, community and large water storage and irrigation projects in areas where there were special needs.

An unusually heavy program of development in this field was carried out during 1961-62, partly due to the extension of the boundaries of P.F.R.A. to include the northern farming areas of the Prairie Provinces, and partly due to extreme drouth conditions during this period.

### Farm and Community Projects

The three main types of projects built under this program are dugouts, stock watering dams and small irrigation projects. For farm projects, financial and engineering assistance is provided on a self-help basis, with P.F.R.A. supplying all the agricultural and engineering services required and approximately 50 per cent of the cost of construction. On larger projects which serve whole communities, consideration for assistance is based on their individual merit and, due to their size, the major share of cost is borne by P.F.R.A.

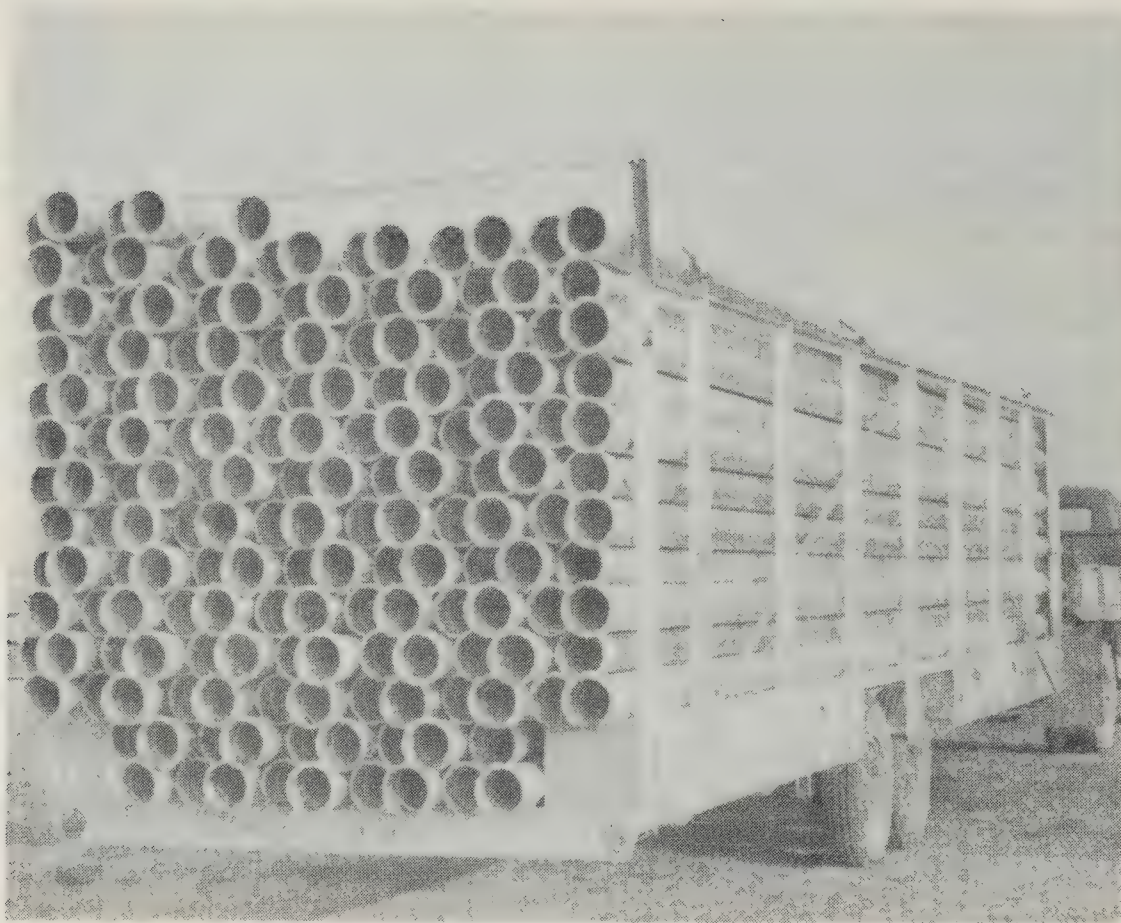


Dry conditions in 1961 required farmers to haul water for livestock and other farm purposes.

Ref. No. 22315

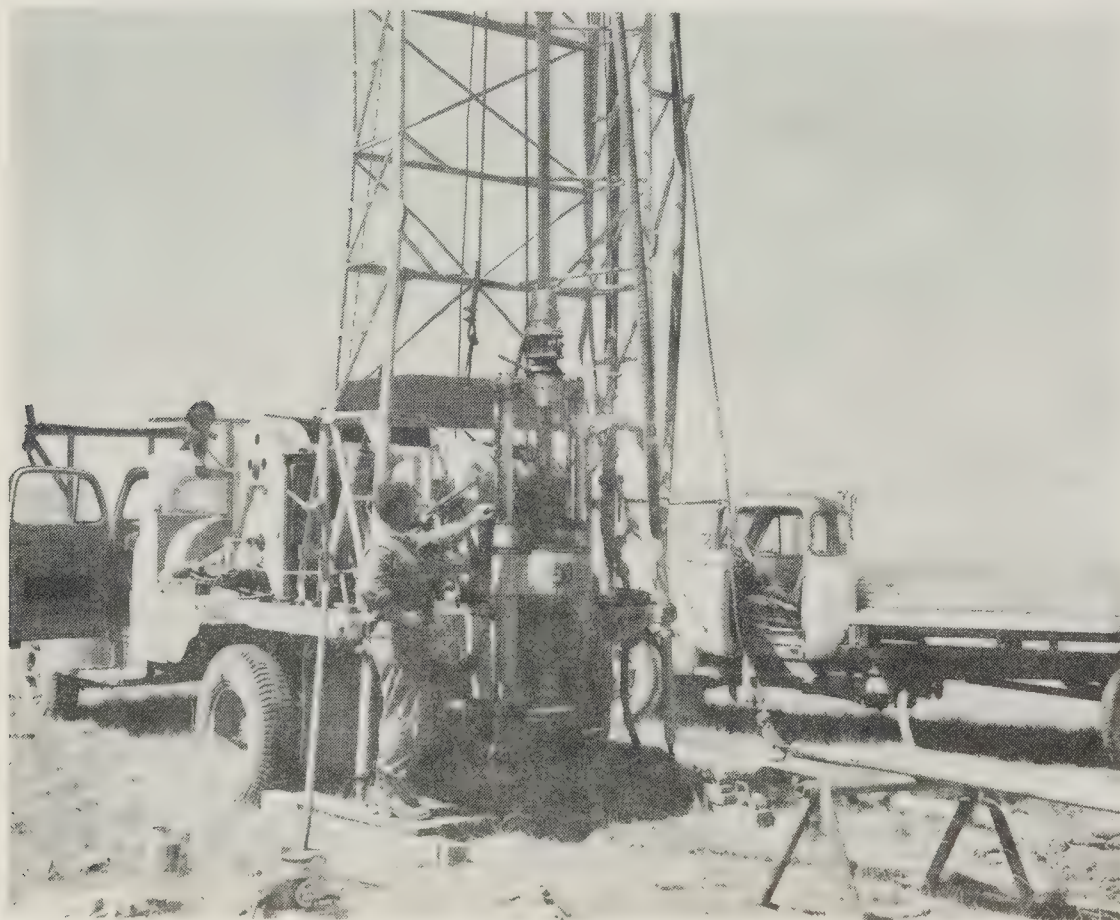
In 1961, applications were received and payments made on a total of 9,650 farm projects - double the construction total reached on any previous year. This included construction of 5,500 farm projects in Saskatchewan, 2,550 in Manitoba and 1,600 in Alberta. In addition, 64 community projects were completed.





Five thousand feet of pipe used in emergency dugout pumping operation with six such units being used by PFRA during 1961.

Ref. No. 22464



Drilling operations being conducted in connection with the Federal-Provincial community well-drilling program.

Ref. No. 22255

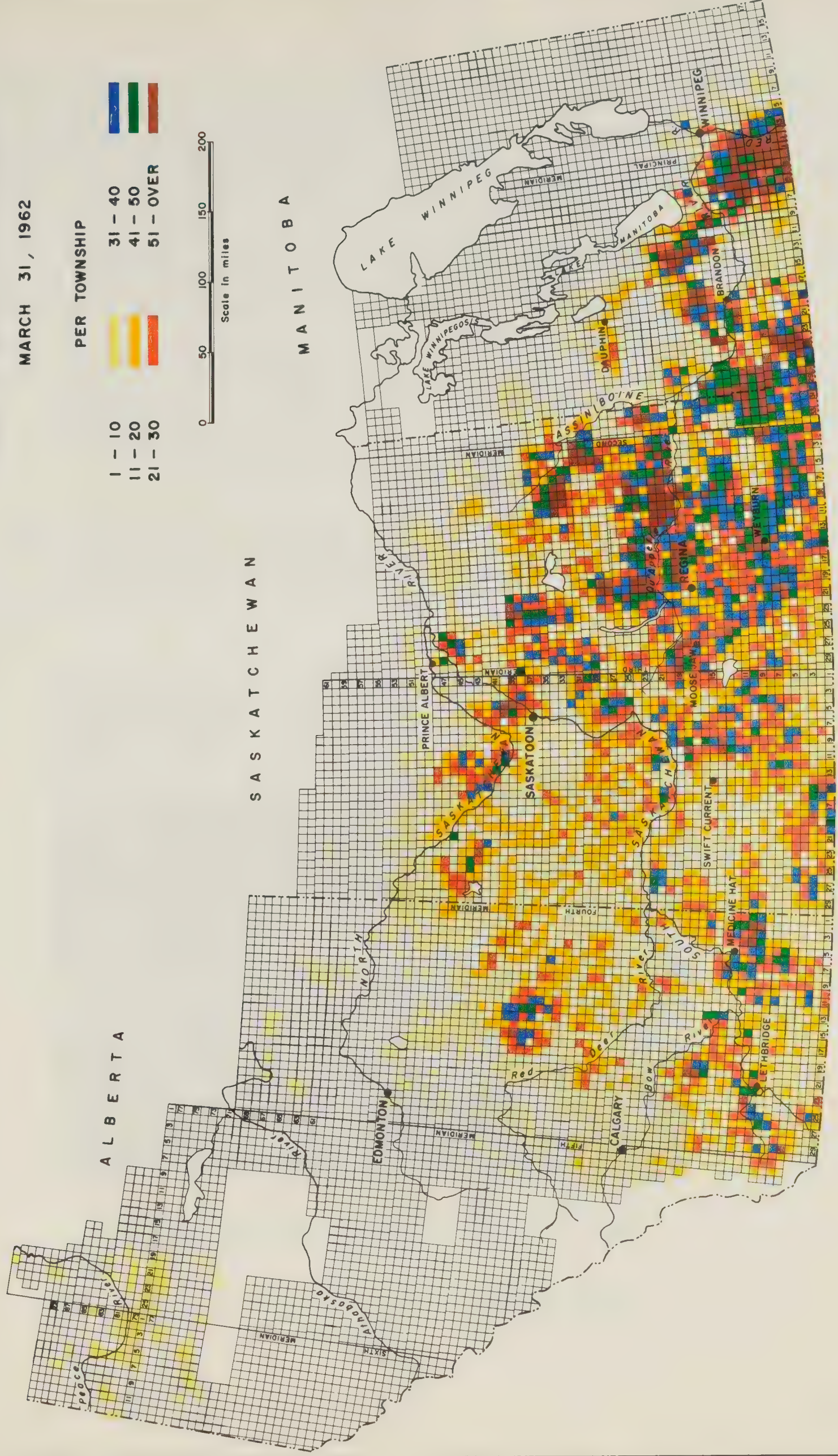
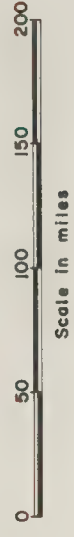


P.F.R.A.

# SMALL WATER PROJECTS

MARCH 31, 1962

PER TOWNSHIP







Superimposed on this were two special emergency programs in water development conducted by P.F.R.A. during the year to relieve the critical water shortage problem prevalent on the prairies. This included an emergency well drilling program sponsored by the federal government in co-operation with provinces and municipalities, and an extensive dugout pumping program conducted by P.F.R.A.

The Federal-Provincial-Municipal Emergency Well Drilling Program came into effect on October 1, 1961. A total of 165 applications for assistance from municipalities in the Prairie Provinces were approved for development. There were 149 applications in Saskatchewan, 10 in Manitoba and 6 in Alberta.

The dugout pumping program involved the use of six mobile units, each equipped with 1 mile of pipe. These units operated continuously from August 1 to freeze-up. During this time this equipment was used on 463 projects and involved pumping 122 million gallons of water.

### Large Water Development Projects

Large water conservation projects are undertaken by agreement between the Government of Canada and provincial or local governments concerned, in areas where there are special needs. Following is a brief description of the projects on which work was undertaken or completed during the 1961-62 fiscal year.



Steel piling being driven in connection with the construction of the LaSalle River Dam in Manitoba.



## LaSalle River Dams

Two new dams of the sheet-pile, rock-fill overflow type were built on the LaSalle River at LaSalle and Starbuck during 1961. The structures will have the function of raising and maintaining water levels on the LaSalle River for stock watering and domestic purposes. Construction of both structures was completed within the year.

### Perry Park Dam

Similar to the LaSalle and Starbuck dams, the Perry Park dam on the Whitemud River at Westbourne, Man., replaces an older Canadian Pacific Railway overflow dam which had fallen into disrepair. The function of the structure will be to maintain the waters in the Whitemud River at a more constant level for the benefit of stockmen and home owners in the district served by the project. Tenders were called for demolition and replacement of the old dam in the spring of 1961 and building of the new structure was completed in late September of the same year.

### Plumas Dam

This structure on Jordan Creek at Plumas, Man., replaces an older P.F.R.A. community water storage project which had to be condemned due to unsatisfactory foundation conditions. The new project is similar in design to structures built on the LaSalle River at LaSalle and Starbuck, and on the Whitemud River near Westbourne, Man. It will improve water level conditions in Jordan Creek and provide a water supply for a 19,000 cubic yard off-channel dugout located slightly upstream from the main works which were constructed by P.F.R.A. at the same time. This work, which began in September 1961, was completed six weeks later.

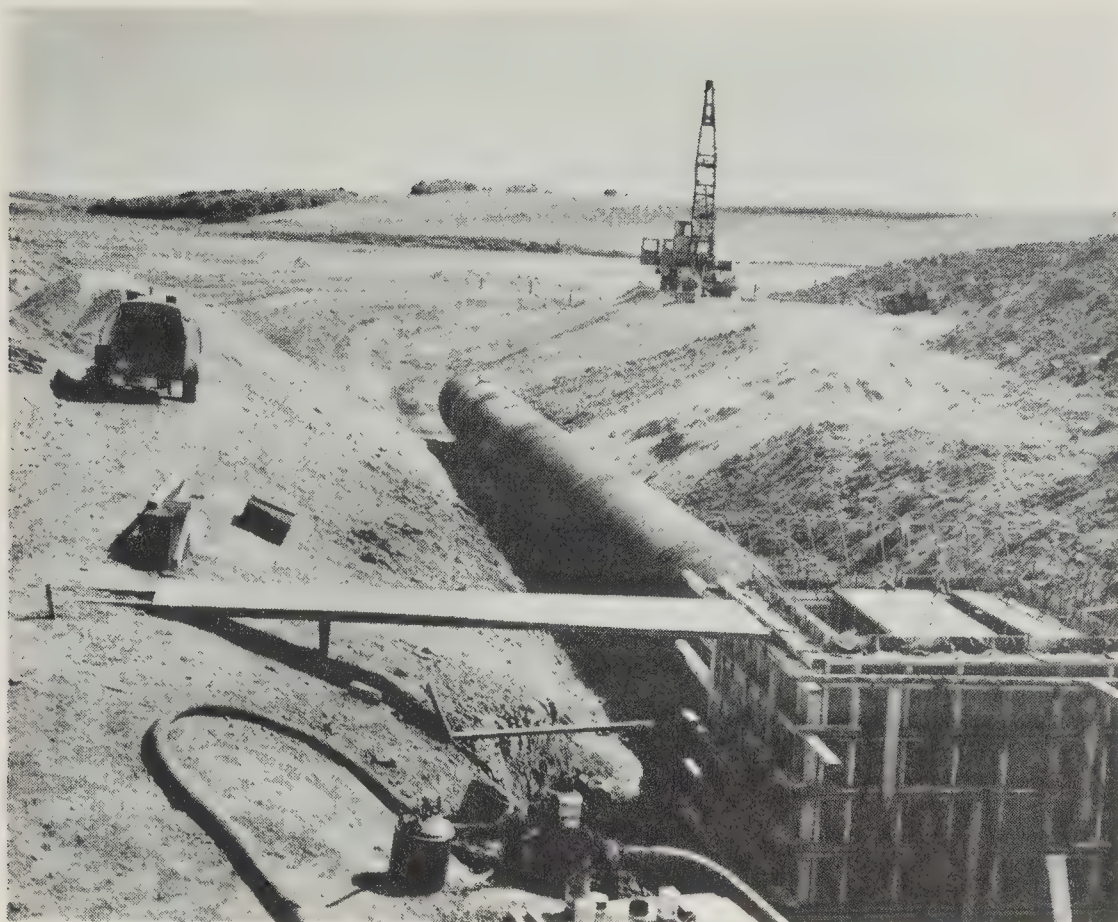
### Deloraine Dam

The Deloraine Dam will create a 1,400 acre-foot water storage reservoir on Turtlehead Creek located six miles southeast of Deloraine, Man., on the northern slopes of Turtle Mountain. Tenders for construction of this project were called by P.F.R.A. in October 1961 and the contract awarded shortly thereafter. Included in the contract was provision for clearing brush from the proposed reservoir area. This work commenced immediately and was completed early in December 1961. Actual construction of the project itself will commence in the spring of 1962 as soon as ground conditions will permit.

### Boissevain Water Storage Project

Owing to repeated failure of the earth emergency spillway at the East Dam of the Boissevain Project, it was decided in 1961 to install a new drop-inlet-pipe spillway. This job, which was carried out by a P.F.R.A. construction crew from Moose Jaw, began during the latter days of July and was completed early in September.





Drop inlet structure under construction at site of Boissevain Dam in Manitoba.

Ref. No. 52077-8

#### Oungre Community Project

The Oungre Project is a community water storage structure with a capacity of 325 acre feet, constructed on a tributary to Long Creek two miles northwest of the Village of Oungre, Sask. The project, which consists of a 25-foot earthfill embankment, a drop-inlet spillway, a riparian outlet and emergency spillway, will be used by the municipality within which the reservoir is located, for stock watering and farm water supply.

#### Birch Hills Community Storage Project

This project is a giant dugout, the largest ever constructed by P.F.R.A., located adjacent to Cromarty Creek about two miles west of the Town of Birch Hills, Sask. The project, which possesses a storage capacity designed for 125 acre feet of water, was built to provide a dependable source of water for that area. Water will be obtained via a 4,000-foot diversion canal from Cromarty Creek. Construction of the project commenced in July 1961, and was completed in September of the same year.

#### Cleland Dam

The Cleland Dam is located on a tributary of Eaglehill Creek, approximately 10 miles north and two miles west of Rosetown, Sask. The dam, possessing a drop-inlet spillway, riparian outlet and emergency spillway, provides a storage capacity of 210 acre feet of water. It was constructed for the R.M. of Marriott #317 for stock





Large community dugout under construction at Birch Hills,  
Saskatchewan.

Ref. No. 22525-3

watering, irrigation and farm water supply. Construction of the project commenced in August 1961 and was completed in December of the same year.

#### Antler Creek Project (Carnduff Dam)

The Carnduff Dam, completed in January 1962, is a 790 acre-foot water storage project constructed by P.F.R.A. for the R.M. of Mount Pleasant. It will be used for stock watering and farm water supply. Located on Antler Creek approximately four miles northwest of Carnduff, Sask., the project consists of an earth dam and concrete chute-type spillway with stop log control.

#### West Poplar River Development Conservation Reservoir No. 1

The West Poplar Dam is located on a branch of the West Poplar River about 12 miles southwest of Wood Mountain, Sask. Present construction plans call for increasing the size of a smaller P.F.R.A. structure built in 1957, to a 1,000 acre-foot storage capacity, and provide for a drop-inlet spillway and new riparian outlet. The project, which is being constructed for the Province of Saskatchewan is primarily for irrigation. Construction was started late in 1961, using P.F.R.A. forces, in order to take advantage of dry foundation conditions existing at that time. It is to be completed in 1962.



### Nashlyn Irrigation Project

This project involved the enlargement and renovation of an existing irrigation system to provide water for some 1,000 acres of potentially irrigable land near Consul, Sask. Included in this work during 1961 was the construction of a diversion weir on Battle Creek, and reconstruction of approximately 4.2 miles of diversion canal to the irrigation project reservoir. A new canal, to serve the land to be irrigated, was also built complete with check structures, turnouts for irrigation, and bridges or culvert road-crossings as required.

### Parr-Castor Project

Construction work on this project in 1961 involved the installation of a new drop-inlet type spillway to replace an older eroded concrete chute structure which was being undermined by water. This work was started late in the fall of 1961 and completed early the following spring.



Timber work in progress in connection with the construction of a rock-filled timber crib diversion weir on the Nashlyn Irrigation Project in southwestern Saskatchewan.

Ref. No. 22423-5

Technical Assistance

In addition to financial assistance provided for "farm" and "community" projects, the following free field services were supplied by the Water Development Branch in 1961-62.

	<u>Agricultural Services</u>	<u>Engineering Services</u>
<u>Dugouts</u>		
Preliminary calls	2,317	-
Final inspections	10,351	-
Miscellaneous inspections	1,189	-
<u>Stock Watering Dams</u>		
Preliminary calls	480	-
Final inspections	193	452
Miscellaneous inspections	293	970
Surveys completed	-	694
Plans prepared	-	630
<u>Irrigation</u>		
Preliminary calls	473	-
Final inspections	158	284
Miscellaneous inspections	263	1,125
Surveys completed	-	599
Plans prepared	-	481
<u>Community Projects</u>		
Preliminary calls	140	-
Final inspections	49	-
Miscellaneous inspections	190	-
Projects investigated	-	180
Projects built	-	61
Surveys & Plans prepared	-	53
Maintenance	-	72
Sub Totals	16,096	5,601
TOTAL		<u>21,697</u>





Soil drifting on cultivated land near Assiniboia in southwestern Saskatchewan resulting from drouth conditions which prevailed during 1961.

Ref. No. 21992



Cutting and baling sparse oat crop for feed on farm near Carlyle in southeastern Saskatchewan during drouth of 1961.

Ref. No. 22321

## COMMUNITY PASTURE PROGRAM

Under the terms of the Prairie Farm Rehabilitation Act as amended in 1937, an extensive program of community pasture development was undertaken by P.F.R.A. It was aimed primarily at converting submarginal crop land into high-producing grazing land for the benefit of farmers in surrounding areas. For this purpose, land proven unsuitable for cultivation was fenced, re-seeded to grass, and otherwise improved for community pasture purposes. Since the program came into effect, 2,097,544 acres of land in the provinces of Manitoba, Saskatchewan and Alberta, incorporated into 68 separate operating units, have been enclosed in community pastures. During 1961 the average carrying capacity was 14.2 acres per head and these pastures grazed a total of 147,080 head of livestock owned by 7,147 patrons.

### Pasture Operations

Extreme and widespread drouth conditions, the worst experienced since P.F.R.A. pasture operations commenced in 1937, resulted in a difficult year. The value of an adequate carry-over of grass from former years was obvious. This carry-over enabled most pastures to carry normal numbers of livestock for most of the grazing season. In a few cases, shortage of grass and water made it necessary to terminate the grazing season somewhat earlier than usual.



One of the more important headwater storage reservoirs constructed by PFRA in southwestern Saskatchewan to assure dependable water supplies for livestock and irrigation in that area.

Ref. No. C-133

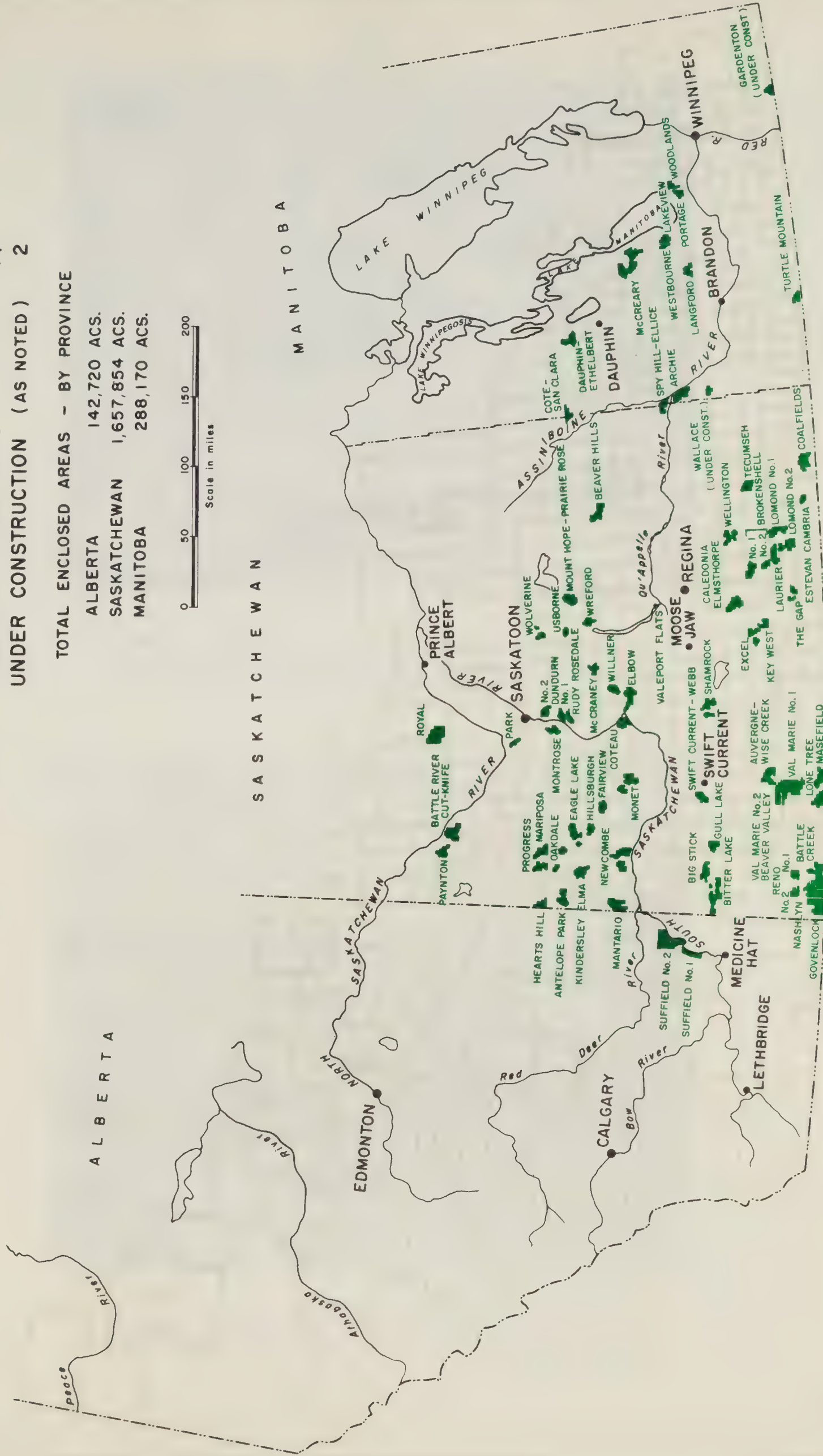


# COMMUNITY PASTURES - MARCH 31, 1962

COMPLETED PASTURES 71  
UNDER CONSTRUCTION (AS NOTED) 2

## TOTAL ENCLOSED AREAS - BY PROVINCE

ALBERTA	142,720 ACS.
SASKATCHEWAN	1,657,854 ACS.
MANITOBA	288,170 ACS.









Unloading screening pellets from box cars at Craven, Saskatchewan to be used in an emergency livestock holding pasture established by PFRA on the Valeport Flats.

Ref. No. 22318



Valeport Flats livestock holding area established by PFRA in 1961.

Ref. No. 22316

Three new pastures commenced operations in 1961. Two pastures in the Turtle Mountain and Dauphin-Ethelbert areas of Manitoba were filled to capacity with a total of 2,620 head of cattle. In Alberta a pasture was established on the Defence Research area near Suffield. This pasture contains 142,720 acres and handled over 8,000 head of cattle from the driest area of Western Canada.

An emergency holding area was established on the Valeport Flats near Craven, Sask., in July 1961 owing to an acute shortage of water and grass in the district. This project maintained over 1,800 head of cattle during the late summer and fall months on a ration of refuse screening pellets. The value of such pellets for livestock maintenance was demonstrated. It was evident that these pellets, with limited grazing or supplemental roughage, provided a satisfactory emergency ration for cows and calves.

#### Pasture Services

The Prairie Farm Rehabilitation Administration establishes the carrying capacity of each pasture annually. With this figure as a guide, pasture advisory committees allocate pasturage in accordance with policies established by P.F.R.A., setting the maximum number of stock per patron allowable under local conditions. Following is the present rate schedule for pasture services effective during 1961.

Grazing Rates	Dollars
Cattle per head per day	.03 1/2
Horses per head per day	.04 1/2
Sheep per head per month	.11 1/2 (provide own herder)
Cows per head (breeding service)	4.00
Calves of current year, sucking with dam, born before August 1st	3.50
Colts of current year, sucking with dam, born before August 1st	4.50

#### Minimum Grazing Fees per Head

Cattle	4.00
Horses	5.00
Sheep	.40

(No charge is levied on colts and calves born in pasture after July 31 of current year to end of summer season)

#### Rates for Vaccine and Other Services

Blackleg, hemmorrhagic and mixed vaccine per single dose	.15
Warble & hornfly spraying per head, (treatment at corral)	.15
Dehorning, per head	.50
Mineral supplement, per head	.35



Castration: Cattle under 6 mos, per head	1.00
Cattle over 6 mos, per head	2.00
Encephalomyelitis and special vaccines	
at cost	

(All hay must be put up on a share basis, such to be governed by quality and quantity available)

Where extra wood in community pastures is available, the following rates will apply, subject to approval of the pasture manager and confirmation from head office.

Dry wood, per cord	.50
Green wood, per cord	1.00

### Haying and Regrassing

Over 4,000 tons of hay and green feed were harvested on community pastures. In some instances adjacent farmers put up part of this hay on a share basis. Eight hundred tons of hay were harvested at the Suffield Experimental Station in Alberta. It was allocated to 130 stockmen and sold at cost to alleviate the fodder shortage in southeastern Alberta.

During 1961, four thousand and eighty-six acres were regrassed: 330 acres of clover, 293 acres of brome and crested wheat grass, and 3,463 acres of mixed grasses.



Trucks waiting their turn to load cattle during fall roundup operations on the Suffield Community Pasture.

## Fires and Fire Protection

Due to the prolonged dry spell the fire hazard was greater than usual. Two accidental fires in the Wolverine and Coalfields pastures resulted in the loss of 10,000 acres of grass. Other fires started by lightning occurred in several prairie pastures but these were brought under control with little damage being done. In the parkland areas a number of bush fires resulted in minor losses of grazing.

Motorized units working out of Moose Jaw maintained 794 miles of fire-guard and built 24 miles of road which also serves as a fireguard. Pasture headquarters are equipped with power spraying units for added protection against fire.

## Grasshopper Control

Grasshopper outbreaks in pastures were particularly severe in southeastern and west-central Saskatchewan. The new insecticide 'Sevin' was used on 10,000 acres in these areas with satisfactory results.

## Breeding Service

The Prairie Farm Rehabilitation Administration purchases and maintains purebred beef-breed bulls for service in community pastures for the benefit of patrons. During 1961, six hundred and ninety-nine Hereford, 71 Shorthorn, 41 Angus, and 20 Charolais bulls were supplied by P.F.R.A. and 409 were rented from patrons under this program. Also, 195 Hereford and 25 Aberdeen Angus bulls were purchased to provide replacements in following years.

Pastures are charged \$40.00 per bull annually - a rate based on the cost of the bull, length of service and salvage value. Under this program 40,867 cows were serviced during the grazing season. Nine hundred and seventy-nine bulls were wintered on the various pastures and at the Archie and Bitter Lake bull stations, for use in 1962.

Artificial insemination was also used at the Kindersley-Elma and Laurier pastures for breeding purposes. At the Kindersley-Elma pasture the program was handled through the Teo Lake Artificial Breeding Co-op, with 267 cows being bred. At the Laurier pasture the Weyburn Artificial Breeding Co-op serviced 710 cows during a six-week breeding season. Conception rates were satisfactory.

## Livestock Losses

There were no serious outbreaks of disease in community pastures in 1961. Due to the extreme heat and high evaporation, water in one slough at Tecumseh Pasture became excessively saline and 28 head of stock died from salinity poisoning. In two pastures in Manitoba, water was also suspected in the loss of 16 head, mostly calves. All cattle handled in community pastures are subject to federal 'animal health' regulations and local municipal bylaws in connection with tuberculosis and brucellosis eradication programs.



## Livestock Insurance

Thirty-eight pastures have mutual insurance and 30 pastures have no insurance. Of the 748 head of stock reported missing or dead, approximately 0.5 percent of the total livestock handled during the season, 453 were eligible for insurance. The accumulated insurance reserves at March 1, 1962, totalled \$65,852.77.

## Pasture Construction

Eight construction crews were engaged in the construction of new projects during the year, including the Suffield, Gardenton, Wallace, Foam Lake and Kelvington pastures. As a result of this work 158 miles of fence were erected to enclose an additional 158,920 acres. Three complete sets of headquarters buildings located at Turtle Mountain, Dauphin-Ethelbert and Oakdale pastures were constructed. It is anticipated that two of the four new projects currently under construction will go into operation in 1962: Gardenton (14,160 acres near Vita, Man.); and Wallace (10,500 acres near Virden, Man.). The Foam Lake project near Margo, Sask., and the Kelvington project near Kelvington, Sask., will go into operation in 1963.



Fencing crew erecting portion of 47 miles of fence required to enclose newly established Suffield Community Pasture in Alberta.

Ref. No. 22257

Due to the increasing demand brought about by drouth conditions, and the general increase and growth in the number and size of the pastures, an additional water development crew was organized. This activity is outlined in the following table.

Summary of Pasture Construction Activities - 1961-1962 Season

Particulars	Projects Completed in 1961	Repair Work Completed in 1961	Total to March 31, 1962.
Fencing	158 3/4	55	4,867
Corrals	8	9	171
Pasture Manager Dwellings	3	2	63
Riders' Cabins	0	0	35
Barns	2	2	63
Garages	3	0	64
Bull Sheds	2	2	60
Others (Granaries, oil sheds, chicken coops, pump houses, etc)	8	2	188
Windmills	51	7	482
Wells	55	69	439
Springs	18	9	212
Dams	6	3	284
Dugouts	78	57	793

Total number of acres enclosed as at March 31, 1961 . . . . . 1,933,834

Total number of acres enclosed 1961 construction season . . . . . 158,920

Total number of acres enclosed as at March 31, 1962 . . . . . 2,092,754

Pasture Improvement

Although the extremely hot and dry weather conditions which existed during the summer of 1961 took its toll on dry-land grass production, it furnished ideal growing conditions where irrigation could be applied, or where soil moisture was sufficient from previous years of irrigation or flooding. Large areas which had been treated by contour furrowing in the Val Marie pasture increased grass production over untreated areas. Other water conservation measures such as tooth pitting, showed some increase in grass production over untreated areas.

The warm, dry spring permitted regrassing operations to be started on April 5 and completed by May 15. All fall seeding had to be cancelled because of depleted soil moisture conditions caused by the intense drouth.

Improvement work during 1961 was concentrated on developing flood irrigation projects started in previous years, surveys for future development, grass



and stock water surveys, and brush control. Other work included the construction of stock watering facilities and fireguards.

Three hundred and sixty acres of flood-irrigated pasture were developed in the Lone Tree pasture; 40 acres of flood-irrigated forage land were developed in the Auvergne-Wise Creek pasture; and a 100-acre drainage and flood scheme was completed in the Royal pasture. Eight hundred acres of sweet clover were seeded for soil conditioning on flood projects in the Battle Creek and Reno #1 pastures, and 300 acres were regrassed in the Val Marie pasture. An additional 22 stock watering facilities were constructed and 15 stock watering dams repaired. For brush control, three thousand acres were sprayed with herbicides by ground equipment and 200 acres by aircraft. Production of fodder on flood irrigation projects amounted to 1,535 tons.

## REHABILITATION and RESETTLEMENT

In addition to the amendment to the Act that provided for the development of community pastures, provision was also made for resettling and rehabilitating farmers moved from areas proposed for pasture development. This was achieved without moving farmers out of the area, wherever it was possible. In other instances, it was necessary to move farmers to other districts and rehabilitate them on land more suitable for dry-land farming, or on irrigation projects developed specifically for the purpose. Since the program came into being in 1935, approximately 5,000 families have been rehabilitated.

Irrigation projects which P.F.R.A. built and continues to operate, are found both in southwestern Saskatchewan and southern Alberta.



Profusion of bales denotes good hay crop produced on irrigated land at Rush Lake, Saskatchewan despite drouth conditions prevailing during 1961.

Ref. No. 22223-3

In Saskatchewan these are located at Val Marie, West Val Marie, Consul, Eastend, Maple Creek and Swift Current. In these six projects approximately 35,000 acres of irrigable land have been made available to farmers and ranchers in surrounding districts for the production of assured livestock feed supplies. During 1961, twenty thousand acres of this land were irrigated, producing between 50,000 and 55,000 tons of hay for the 500 farmers utilizing the projects. As a result of this irrigation, sufficient hay was produced to maintain the 35,000 to 40,000 head of breeding stock carried by patrons in the area with minor exceptions, in spite of extremely dry weather conditions.



In the Hays resettlement district of the Bow River project there are now 152 farmers and no further movement of settlers is anticipated. Efforts during the past year have been concentrated mainly on consolidating units and extending assistance to farmers to hasten their rehabilitation.

Assistance offered by the Government of Canada in this regard is provided in the form of special loans for housing, fencing, and the purchase of livestock. Under this program, individual loans of \$2,000 for material to construct dwellings, \$1,000 to assist in the purchase of breeding stock, and \$750 for fencing material, were made available to new settlers. A summary of loans made under this program to December 31, 1961, was as follows:

Housing:	50 loans approved . . . . .	\$91,050.02
	Expenditure to December 31/61	81,955.72
Fencing:	38 loans approved . . . . .	21,310.94
	Expenditure to December 31/61	12,917.26
Livestock:	36 loans approved . . . . .	36,000.00
	Expenditure to December 31/61	30,010.80



Resettled on the Bow River Irrigation Project near Hays in 1954, this farmer is now becoming well established on the new land provided.

Ref. No. 20465

In connection with the program to consolidate units during 1961, eighteen farmers received additional land to increase their total acreage, eight farmers transferred their interest from one additional parcel to a new parcel, four leases on additional parcels were cancelled, and three farmers discontinued farming.

For further details on progress in agricultural development of the area, refer to the section of this report entitled "Major Irrigation and Reclamation Projects" under the heading "Bow River Irrigation Project".



## MAJOR IRRIGATION and RECLAMATION PROJECTS

Major irrigation and reclamation projects on which work was carried out during the year, are reviewed in the following.

### St. Mary Irrigation Project

The St. Mary Irrigation Project involves the construction of works to irrigate approximately 500,000 acres in southern Alberta, utilizing Canada's share of the water resources in three major important streams - the St. Mary, Belly and Waterton Rivers.

Under an agreement between the Government of Canada and the Province of Alberta, construction was started in 1946 with Canada assuming responsibility for the engineering and supervision of the entire project and the cost of construction of the main storage and diversion works and connecting canals. Alberta, in turn, agreed to provide financing for the construction of the distribution systems and agricultural development and settlement of the project. To cover the cost of irrigation development on the project, the province collects from the farmers, an amount equal to \$10.00 per irrigable acre. For operation and maintenance of the main reservoirs and connecting canals, Canada charges an amount not to exceed 25 cents per acre foot for water delivered to the Province of Alberta for distribution to the irrigated area. During the past year this amount nearly equalled the cost of operation and maintenance.



Water issuing from outlet of river diversion tunnel on the Waterton Dam currently under construction in southwestern Alberta.

Construction of the main works, with the exception of the Waterton Dam currently under development, and construction of the Waterton to Belly River Diversion Canal, is now completed. Distribution works have been constructed and are now in operation to serve a total of 304,000 acres of which 120,000 acres were irrigated prior to 1946.

Capital funds expended by the two Governments to March 31, 1962 are approximately:

Government of Canada (P.F.R.A.)	\$24,355,000
Government of Alberta	19,234,000

#### Engineering and Construction

Design work continued during 1961 on the Waterton Spillway and other appurtenant structures required for the Waterton Dam and diversion works. Surveys, investigations and planning were also continued on portions of the irrigation distribution system remaining to be built.

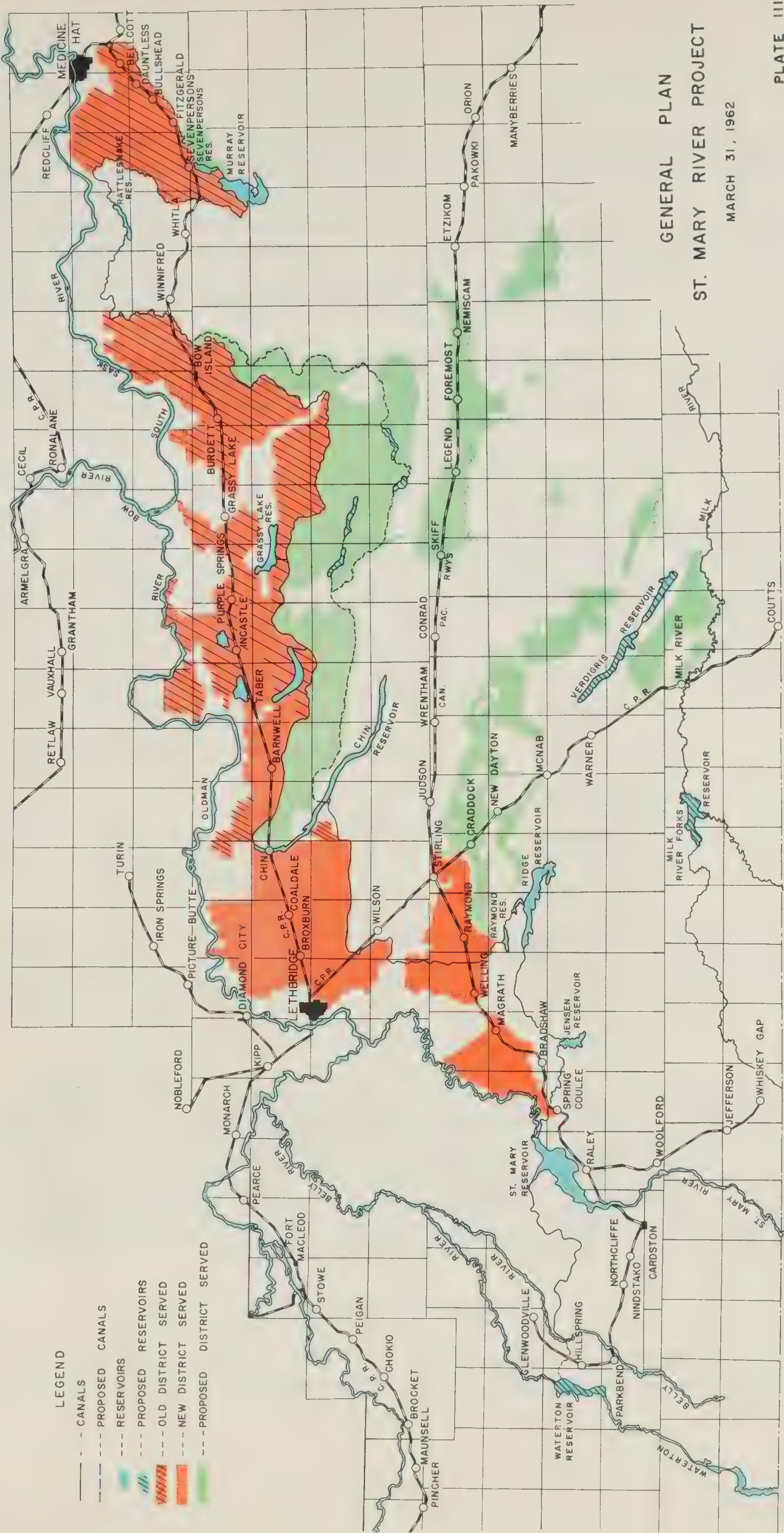


Aerial view of Waterton Dam in southwestern Alberta, showing progress in construction to June 1961.

Ref. No. 22087

On the Waterton Dam, construction activity centered around the construction of the main embankment. This work, which started late in 1960, progressed favorably during 1961 and was reported approximately 50 per cent completed by the end of the year.





GENERAL PLAN  
ST. MARY RIVER PROJECT  
MARCH 31, 1962





## Operation and Maintenance

Use of irrigation water on the St. Mary Project reached a record high during 1961 due to drouth conditions. Delivery of water from the St. Mary Reservoir was 415,000 acre feet and with the use of additional storage contained in Chin Reservoir, about 478,000 acre feet of water were delivered to the project for irrigation. This represented an increase of approximately 37 percent over 1960. In spite of this heavy delivery, storage in the upstream reservoirs was high at the year end, ensuring an ample supply of water for irrigation in 1962.

Work carried out by P.F.R.A. maintenance crews during 1961 included only minor expenditures for alteration or addition to existing works, as well as routine activities associated with the operation and maintenance of structures for which Canada is responsible.

## Agricultural Development

Specialty crops and livestock production continued to play an important role in stabilizing the economy of the area served by the St. Mary Irrigation Project. This was particularly evident over the past year during which dryland farming suffered so greatly from drouth conditions. Indicative of this is the value of livestock sales realized in the Lethbridge area during 1961 (\$25,300,000 compared with sales of \$22,551,000 reached the year previous) and the acreage distribution for different kinds of irrigated crops in southern Alberta:

Green vegetables and canning crops	15,000 acres
Potatoes	9,600 "
Sugar Beets	41,000 "
Sunflower seed	2,000 "
Seed crops (for oil)	39,000 "
Fodder crops (alfalfa, etc)	220,000 "

Also apparent is an increasing interest shown by producers, processors and government agencies in opening up new market opportunities for specialized crop production through research and expansion of handling and processing facilities.

## Recreation

The use of reservoirs on the project for recreational purposes has developed rapidly in recent years. Many of the reservoirs have been stocked with game fish. Boating, fishing, swimming and picnicking are being enjoyed by an increasing number of people. Some trees have been planted along the south shore of the St. Mary Reservoir and natural beaches are developing, making this reservoir an excellent spot for aquatic recreation. Three boat clubs are now licensed to use the St. Mary Reservoir, and small backwater ponds below the dam have been stocked with trout.

## Bow River Irrigation Project

The Bow River Irrigation Project is situated west of Medicine Hat. It has an irrigation potential of 240,000 acres broken down in the following manner:

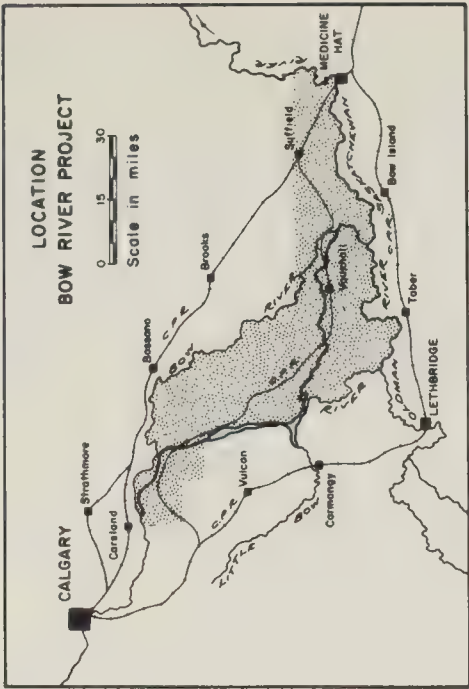
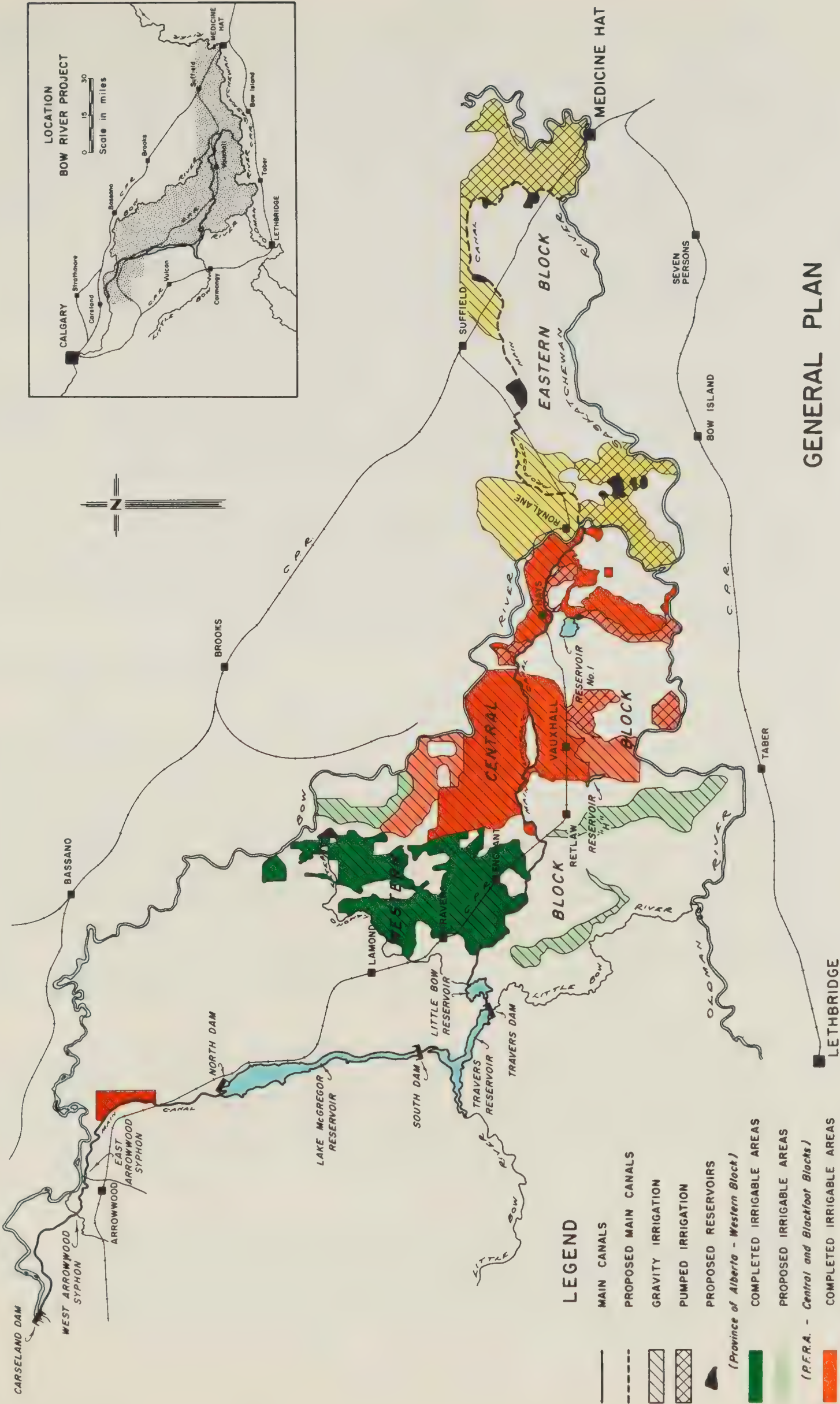
West Block	25,000 acres
Central Block -	
Vauxhall	63,000 "
Hays	27,000 "
East Block	120,000 "
Blackfoot Indian Irrig. District	<u>5,000 "</u>
Total irrigable acreage	240,000 "

The West Block is controlled by the Province of Alberta, and the Blackfoot Indian Irrigation District by the Indians. The East Block, north of the Bow and South Saskatchewan rivers toward Medicine Hat, is owned by Alberta but has not as yet been brought under the ditch. To provide suitable land for settlers moved by P. F. R. A. , in accordance with the federal government's resettlement and rehabilitation policies, Canada purchased the land and existing irrigation works in the Central Block, together with the main canals and reservoirs serving the overall project. Renovation and extension of irrigation works in this area began in 1950 and is now completed. Water required for irrigation in the Blackfoot Indian Reserve and West Block of the project is wholesaled by Canada to the districts, from the project's main water-supply works.



Concrete drop structure on the main supply canal serving the Bow River Irrigation Project in southern Alberta.





# GENERAL PLAN BOW RIVER PROJECT

MARCH 31, 1962







## Construction

The program of replacing wooden structures with concrete counterparts continued during 1961. In addition, a number of bypasses were constructed around structures on the main canal system to facilitate drainage. To complete Canada's agreement to deliver water to the Blackfoot Indian Reserve, a new lateral turnout was installed in the main canal. A new bridge was also built to provide access to the southwest corner of the Blackfoot Indian Reserve.

Drainage work included the cleaning of 14,050 feet of existing drain and excavation of 8,000 feet of new drain in the Vauxhall and Hays districts, as well as the relocation of 1,920 feet of drain in the south Hays district.

Due to the large head of water carried in canals during 1961 to meet irrigation demands, there was a noticeable increase of seepage below canals and laterals, and alkali has shown up on certain slopes below the ditches. Investigations were carried out during the year and plans have been made to line a number of laterals located in sandy areas to overcome this problem.

As an emergency measure to alleviate a serious water shortage problem that had developed on grazing leases to the southeast of Grantham, laterals which were abandoned by the Canada Land and Irrigation Company were renovated. As a result of this construction, sufficient stock water was delivered from the Bow River Project works to enable the grazing leases to be used all summer and fall.

## Operation and Maintenance

The year 1961 was the driest on record and more irrigation water was provided than ever before. Rainfall for the five-crop-growing months, from April to August, averaged only 4.48 inches in the Vauxhall district. Water was turned into the canal system on April 27 and shut off on October 20. High demand for water and excess evaporation resulted in many canals operating at near capacity throughout the season. Over this period 197,486 acre feet of water were delivered to 721 farm units, a substantial increase over the 149,190 acre feet utilized on the farms in 1960. The Alberta Bow River Development in the West Block was supplied with 34,002 acre feet of water, a substantial increase from the 19,864 acre feet used in 1960. Between the Carseland diversion on the Bow River and Lake McGregor, the canal was operated from May 20 to October 19, a total of 152 days, during which 284,558 acre feet of water was diverted for irrigation purposes.

Maintenance work included minor repairs to checks, bridges, drops, chutes, culverts and turnouts on the irrigation distribution system serving the project, and replacement of certain sections of the East and West Arrowwood siphon pipes which had become crushed, delaminated, or worn through use. In addition, sections of lateral canals "A" and "B" were repaired during the year to improve their efficiency and reduce seepage.

Probably the most serious problem arising in 1961 was the growth of submerged aquatic weeds in canals, resulting in a reduction of canal capacity in many instances to as much as 50 percent. In a season where demand for water was at a peak, the situation was acute. To deal with this problem canals were dragged, using





Sprinkler irrigating a field of potatoes being produced commercially in the Vauxhall district of the Bow River Irrigation Project.

Ref. No. 23112-4

heavy anchor chains for cutting the aquatic growth, which in turn was removed with dragline equipment and hand labor.

#### Agricultural Development

Due to increasing demand for livestock pasturage in the Vauxhall and Hays districts, improvements were made in the efficiency and carrying capacities of the three P. F. R. A. irrigated community pastures in the area. On the Vauxhall Pasture, 160 acres of pasture were broken, levelled and re-seeded. In the Hays area, 400 acres of irrigated pasture were levelled and broken for seeding in 1962. Operation of the pastures began on May 10 and lasted until October 5, a period of 148 days. The livestock carried in the pastures in 1961 were as follows:

Vauxhall Pasture	1,225 cattle
Hays East Pasture	300 "
Hays South Pasture	135 "
	2,600 ewes and their lambs

Due to the extremely dry conditions, approximately 300 head of cattle from Hays were pastured over the summer in the Suffield Community Pasture, which greatly relieved pressure on the Hays grazing leases.

Production on irrigated land again emphasized the importance of livestock and feeding as the major stabilizing influence on the project.

Numbers of cattle on feed in the district declined, as many small feeders sold hay and grain at high prices rather than use it for feed. The total number of



cattle in the district, however, remained stable as more farmers wintered calves for restocking herds and feedlots in 1962-63.



Cattle grazing on one of two irrigated community pastures established by PFRA for the benefit of new settlers in the Hays district of the Bow River Irrigation Project.

Ref. No. 23051

Hog and lamb feeding declined over the previous year with the main emphasis being given to cattle, due to high feed costs and low prices. Turkey production, on the other hand, increased over 1960 due to the establishment of a new plant for dressing and processing poultry products in Lethbridge.

Cereal crops seeded under dry conditions did not germinate until late in the season. As a result, grain crop yields were low in contrast to the high returns realized from alfalfa and forage production.

In the field of specialty crops, potato growers continue to enjoy a steady demand for their product from new processing plants and fresh trade. A number of farmers also grew green canning beans, with returns ranging from \$136 to \$695 per acre. However, production of oil seed crops declined.

### South Saskatchewan River Project

#### General

The South Saskatchewan River Dam is the key structure in long-range plans for controlling the South Saskatchewan River. The reservoir will provide water for hydroelectric power, irrigation, and recreation, as well as for other agricultural and domestic uses. It will minimize severe fluctuations of the water level and make water available for further power development downstream.





Aerial view of the South Saskatchewan River Dam showing progress in construction to August 1961.

Ref. No. 22328

### Design and Planning

The P. F. R. A. Design Division, in association with the Soil Mechanics Division, continued to prepare the contract plans and specifications necessary to keep pace with construction. In addition, plans for other phases of the project scheduled for later construction were carried out, as well as studies of problems encountered during construction. Emphasis was placed on preparing preliminary and final designs of the tunnel gates, the tunnel stilling basin, and the spillway structure.

Final plans and specifications were completed during the year for the control shafts, and the transition sections which will connect the shafts to the upstream and downstream tunnels.

Co-operation with the Saskatchewan Department of Highways continued, particularly on plans and specifications for a contract let during the year covering a highway revision between Tichfield and No. 15 Highway.

### Construction Activities

Construction continued on the South Saskatchewan River Dam Project during the year under the direction of the engineering staff at the construction headquarters.

At this time, the three main components of the dam under construction are the earth embankment, the five outlet tunnels and the spillway.



On the embankment, materials were placed to raise the dam to approximately half of its final height throughout its entire length, with the exception of part of the river channel which is being left open until the tunnel works are completed and final closure can be accomplished. Excavation of the main portion of the spillway area was also nearly completed by the end of the year.

On the downstream portion of the tunnels approximately 10,000 feet of tunnel was excavated to a 25-foot diameter by a type of mining equipment commonly known as a "mole" and a start was made on lining the tunnel walls with a 30 inch thickness of reinforced concrete. In the upstream section, the portals and the intake structures were completed; preparations have also been made to begin excavation of tunnels similar in length and design to those in the downstream section.



Obtaining measurements inside one of the five river diversion tunnels currently under construction at the South Saskatchewan River Damsite.

Ref. No. 66385

Excavation of the five 40-foot diameter control-shaft substructures for the river diversion tunnels was completed during the year. They are now being lined with reinforced concrete in preparation for installing control gates and other equipment necessary to regulate the flow of water in the tunnels. The shafts, approximately 225 feet in depth, are located on the centerline of the dam, each extending vertically from a tunnel to the top of the dam.

Other contract work in progress during the year included processing concrete aggregate for tunnel and spillway construction, constructing a drainage conduit and appurtenances, supplying cement, and revising Highway #19.



A labor force reaching a peak of 1,050 in number during July and August, and dropping to a low of 450 during December, was employed on contract throughout the year. In addition, 250 to 290 people were steadily employed by P. F. R. A. , local businesses and other operations related to the project, over the same period.



Rocks picked from the site of the South Saskatchewan River Dam are stockpiled for use as riprap.

#### Public Relations

Ref. No. 22536

To accommodate visitors (60,000 people this year) a tourist pavilion was operated at a location near the construction headquarters, housing displays, models and photographs. The pavilion is also a vantage point for viewing the construction area. A second viewpoint, attended at appropriate times by the pavilion staff, is maintained across the river.

Family groups, mainly from Saskatchewan, made up the largest number of visitors. However, many came in organized groups, such as service clubs, school and church groups, and agricultural and business organizations. Other visitors during the year were tourists from other parts of Canada and the U.S.A., and state officials and technical groups from Canada and other parts of the world.

In response to requests, illustrated talks were given to various organizations on project construction and development.

#### Pre-development Farm

As construction of the project progresses, there is increasing interest in methods of developing land for irrigation and related problems of crop production





Cutting alfalfa-brome mixture produced on irrigated land on the Pre-development Farm at Outlook, in connection with mechanical grazing experiments currently being undertaken.

Ref. No. 22349



Freshly cut alfalfa-brome mixture is transported directly to the feed lot in the mechanical grazing operation.

Ref. No. 22347



and farm management. The Pre-development Farm, established at Outlook in 1949, continued its primary purpose of providing information, by demonstration, for use in the future development of irrigation in the area.

Mechanical grazing was introduced on the Farm during 1961 with promising results. More emphasis was placed on studying methods of reducing labor requirements and improving the effectiveness of water application.

Plans were made for more participation by the Research Branch of the Canada Department of Agriculture and the Agricultural Engineering Department of the University of Saskatchewan in obtaining data on: (1) farming operations on grass-legume mixtures, (2) fertilizer response, and (3) water application efficiency. In addition, the meteorological service of the Department of Transport, made plans to establish an agro-meteorological station in the research area which will be manned by the farm staff.

Provision is made to have a member of the staff show the increasing number of visitors around the Farm. Also, plans were prepared to increase public interest.

#### Buffalo Pound Lake Water Supply Project

Through an agreement with the Province of Saskatchewan, the Government of Canada assumed responsibility for maintaining water levels in Buffalo Pound Lake, a reservoir in the headwaters of the Qu'Appelle Valley. It is a source of water for the cities of Regina and Moose Jaw, and also supplies water for irrigation



Dyking system established by PFRA at east end of Buffalo Pound Lake to impound water for both agriculture and domestic purposes.



and other agricultural purposes in the valley. Facilities have been installed to increase the water storage capacity of Buffalo Pound Lake and to supplement existing supplies of water in the lake by pumping from the South Saskatchewan River.

During 1961, approximately five months of pumping were carried out, commencing April 27 and extending to September 29. During this period 27,850 acre feet of water were pumped from the river. This was sufficient to supply the two cities and to increase the water level in the lake from 1,669.27 to 1,670.22 feet above sea level.

One major improvement during the year involved raising, widening and strengthening the dyke and works on the east end of Buffalo Pound Lake. This work was carried out by contract and included placing approximately 65,000 cubic yards of compacted embankment and about 15,000 cubic yards of gravel and riprap for roads and slope protection.

### Assiniboine River Project

Activities on this project during the 1961-62 fiscal year, centered principally in two areas: the dyked area on the Assiniboine River downstream of Portage la Prairie, and the proposed Shellmouth damsite near the town of Shellmouth in the upper reaches of the Assiniboine.



Section of dyking system established by PFRA along a stretch of the Assiniboine River for flood protection near Portage la Prairie, Manitoba.



On the former job, dyke reconstruction work was in progress from June through September. During this period, P.F.R.A. forces using rented equipment, repaired and built approximately nine miles of dyke in six separate locations. Prior to the start of construction, all dyked areas repaired during the previous season were seeded to grass.

At the Shellmouth site, surveys, drilling, and special studies were continued in connection with engineering investigations.

#### Northwest Escarpment and Interlake Reclamation Project

Under the terms of an agreement between Canada and Manitoba, mutually acceptable projects for flood control and land reclamation in this large area are undertaken on a cost-sharing basis, with P.F.R.A. offering its engineering services as required.

During 1961 this work centered on three main projects: (1) the continuation of studies in the Wilson Creek Experimental Watershed on the east slopes of the Riding Mountains, (2) reclamation work on the Fairford and Icelandic Rivers in Manitoba's interlake region, and (3) channel improvement on the Icelandic River.

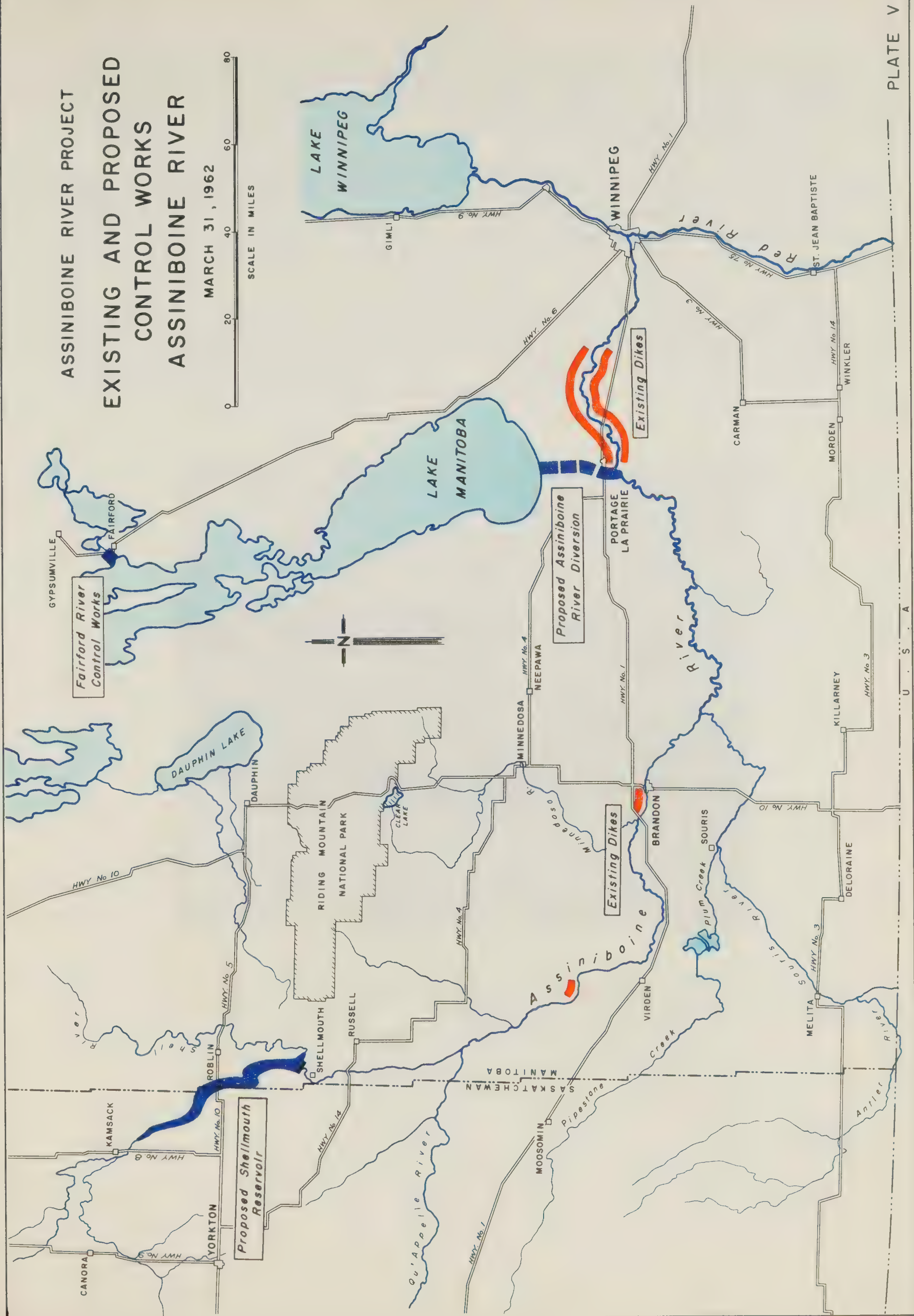
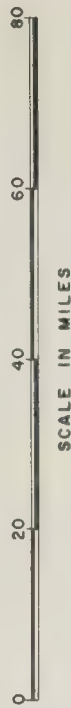


An example of the highly erosive nature of stream banks on the eastern slopes of the Riding Mountains in Manitoba which are currently under study.



# ASSINIBOINE RIVER PROJECT EXISTING AND PROPOSED CONTROL WORKS ASSINIBOINE RIVER

MARCH 31, 1962







On the Wilson Creek Watershed, precipitation, streamflow and weather observations were continued during the year. In addition, a number of vegetative plot studies and bank protection tests were made. These were aimed at reducing the damage from flash floods that occur periodically on this watershed.

On the Fairford River and Icelandic reclamation projects, construction is being carried out under the direction of the province. The larger of these two jobs involved the completion of improvement works on the Fairford River at its outlet to Lake Manitoba. A new control dam was built on this channel, and will have the function of regulating water levels in the lake.

The other project, on the Icelandic River, involves channel improvement work. This work is being carried out just east of Arborg, Man., and will result in the enlargement of about seven miles of river channel in that area. Construction involving two contracts was started in the late summer of 1961 and approximately 40 percent of the required work was completed before freeze-up.



Control dam constructed by the Manitoba Government with PFRA assistance on the Fairford River in the Inter-Lake region of Manitoba to regulate water levels in Lake Manitoba.

Ref. No. 52101-2

## ENGINEERING SERVICES

Following are reports of the work carried out during the year by the specialist divisions of engineering services.

### Design Division

Again during 1961, the South Saskatchewan River Project represented the major item of work for the Design Division relating both to the planning and design, as well as the preparation of specifications on new contracts associated with construction.

Complete plans and specifications were prepared for the Antler Dam, Birch Hills Community Project, Craik Dam, Deloraine Dam, LaSalle Dams (2), Perry Park Dam, Boissevain Project, West Poplar Project and for the construction of a new spillway for Kettlehut Dam. All of the above projects were eventually let on contract, except the last three which were constructed by P. F. R. A. forces.

Complete plans and specifications were also prepared for a new spillway for the Weyburn Dam. Tenders on this project were called by the Department of Public Works of Saskatchewan, and a contract was awarded.

Other projects on which detailed study was undertaken included the Avonlea Dam, Berry Creek Dam (renovations and improvements), Crystal City Project, Esterhazy Dam, Gainsborough Dam, Stephenfield Dam, Summercove Dam (renovations and improvements) and Theodore Dam. Preliminary studies were conducted on the Assiniboine River Project (Shellmouth Dam) and on a plan to drain Lost Lake (Bow River Project).

Studies conducted by the Hydraulic Laboratory included completing model work on the Waterton Spillway, and on spillways for the Craik and Avonlea projects. As a result of these tests, an improved hydraulic design was made possible for each of these structures.

### Drafting Section

During the 1961-62 fiscal year, a total of 700 drawings were produced by the staff of the Drafting Section: the preparation of plans for the South Saskatchewan River Project, drawings for project specifications, and miscellaneous work required by other divisions and branches of P. F. R. A.

Other work provided by the staff of the drafting office included reproducing and assembling specifications and reports; maintaining the technical library, filing engineering drawings, and assisting the Hydraulic Laboratory.

### Air Photo Analysis and Engineering Geology Division

The heavy program of work during the previous year for the Air Photo Analysis and Engineering Geology Division was continued into 1961 within the division's three-fold responsibilities of air photo analysis, engineering geology and photogrammetric mapping.



Office air photo studies for selecting potential damsites and for general water development were carried out on Ribstone Creek, Blood Indian Creek and Pincher Creek in Alberta, Melfort Creek, Pierce Creek, Little Pipestone Creek and the Souris River in Saskatchewan, and Pleasant Valley Creek in Manitoba. Air photo searches for construction materials were conducted in the vicinity of Tulameen in British Columbia, High River, Cameron Projects and Kitsim Reservoir in Alberta, and West Poplar Creek and Antler Creek in Saskatchewan. Detailed investigations into sources of riprap for the South Saskatchewan River Project were made. Comprehensive air photo studies to assist in planning and constructing community pastures at Suffield, Spiritwood and Pasquia were completed.

In the field of engineering geology, studies were continued at The Gap dam-site pertaining mainly to bedrock stratigraphy and structure of the canyon. A preliminary report was also prepared on: (1) the bedrock and surficial geology of a site proposed for a low dam in the Pembina Valley, and (2) brief studies of surface water levels of Old Wives Lake, Sask., and groundwater levels in the vicinity of the south Saskatchewan River Dam.

At the South Saskatchewan River Dam the Division began a mapping program to record the geology of the deep excavations in shale during construction. Mapping was carried out concurrently with the contractor's operations in all cases. It included mapping of the excavations for the high-level intakes, upstream portals, downstream transition structures, and portions of the control shafts and downstream tunnels excavated up to the end of March.



Staff member of Air Photo Analysis and Engineering Geology Division, inspecting shale out-cropping along a stretch of the Boyne River in Manitoba.



Large-scale mapping by photogrammetric techniques included completing work on (1) the reservoir for the South Saskatchewan River Dam and (2) the proposed damsite for the Shellmouth Project in Manitoba. Small-scale mapping of the reservoir area for the Shellmouth Project was also completed. Mapping projects presently under way include the reservoir for dams proposed for construction on Antler River, Swan River and Pembina River.

The contract for periodic air photo coverage of the South Saskatchewan River Dam, to record construction progress and changes in river pattern, was extended. New air photo coverage was also secured for the Pasquia Project and for the valley of the North Saskatchewan River through agreements with the Interdepartmental Committee on Air Surveys sponsored by the Department of Mines and Technical Surveys.

### Soil Mechanics and Materials Division

During 1961 an active soil-sampling and testing program was carried out. It involved drilling over 50,000 lineal feet of test hole and taking approximately 12,000 separate soil samples for testing in the Saskatoon Laboratory. In addition, the drilling section installed several water wells in community pastures.

In the Saskatoon laboratory, both soil and concrete testing were carried out. This included over 60,000 individual tests on soil samples, and 2,000 concrete tests; the majority of the latter being carried out for construction control.

Results of field investigations and laboratory tests are plotted on plans and profiles in the Saskatoon office. The final investigational phase is the preparation of reports which summarize and interpret all the pertinent information and gives design recommendations based on the collected data. Thirty such reports were prepared during the year.

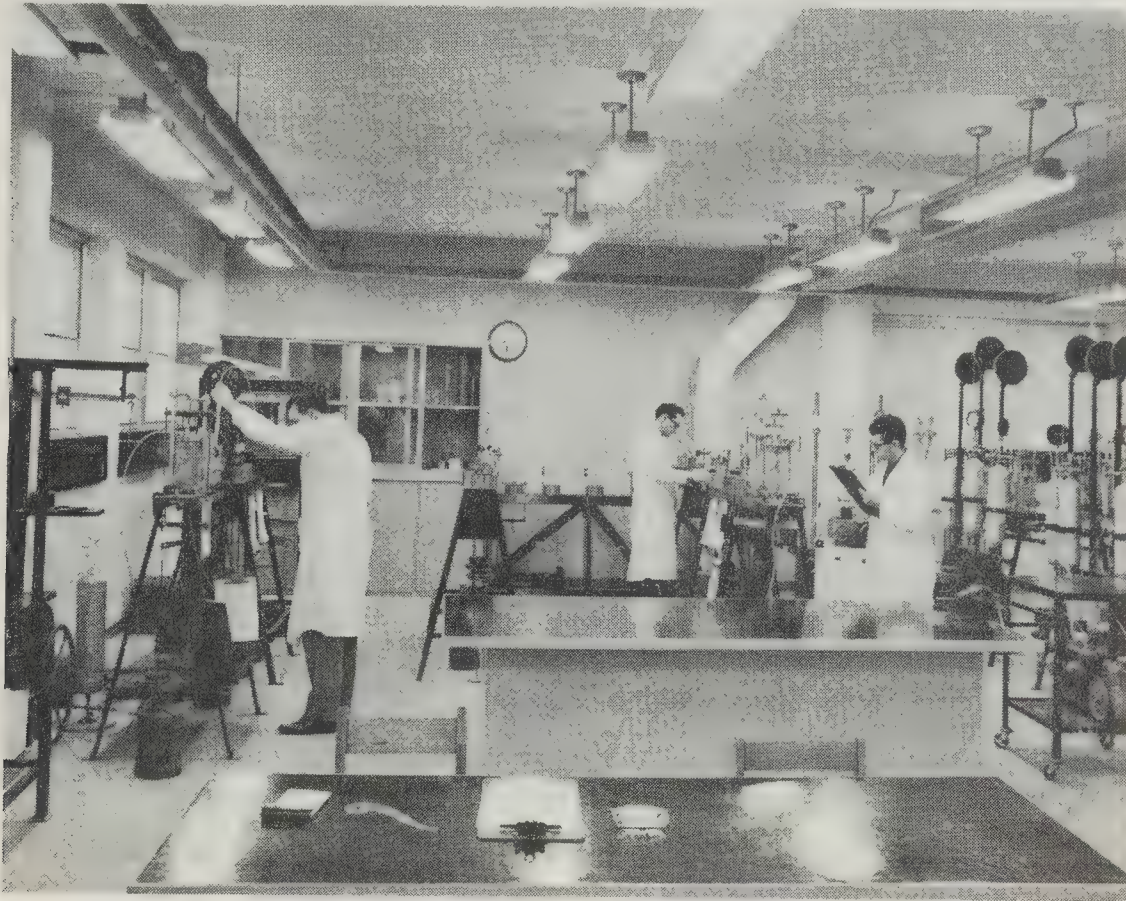
Other activities consisted of installing apparatus at various projects to measure the performance of the structures, and the regular reading of previously installed apparatus. Technical advice and control testing were provided upon request for projects under construction.

On the South Saskatchewan River Project, the division's program of exploration, sampling and testing to obtain more detailed information at structure sites and for new contracts, was continued. Special studies were continued on the stability of the shale, anchor piles in the shale, slope protection and the use of fly ash and sulphate-resistant cement in the concrete.

In addition, the Division was asked to assist the Province of Manitoba in studying the slope stability problems that might arise during the construction of the Red River Floodway. A test excavation was made by the Province in 1961, to get some idea of the difficulties that might be encountered during construction, and to test the strength of the soil in the field by developing slope failures. Test apparatus was installed to measure the behaviour of the soil under both normal and saturated conditions. The test excavation also showed that standard types of excavating machinery would perform reasonably satisfactorily under favorable weather



conditions to the full design depth of the floodway at the test site, despite the soft wet nature of the Red River clays.



Computing soil strength at the Soil Mechanics and Materials Division Laboratory in Saskatoon.

Ref. No. 21721

#### Hydrology Division

To provide information for planning, designing and operating P. F. R. A. projects, the Hydrology Division reported on 44 streams and lakes during 1961. Twenty-four of these involved water supply studies and the remaining 20, flood potential investigations. In addition, 11 miscellaneous studies were made of various hydrologic problems relating to P. F. R. A. projects. A report was also completed on water supply and water use in the Wood River Basin. This information will be useful in planning the full utilization of existing and proposed P. F. R. A. storages on the watershed.

In its capacity as Secretariat of the Prairie Provinces Water Board, and as a result of its relationship with various other agencies, fundamental studies are conducted in connection with water allocation, stream flow analysis, watershed development, etc.

Two of these studies extend use of available hydrometric knowledge to un-measured streams. One of them, the "Magnitude of Frequency of Floods in Alberta, Saskatchewan and Manitoba", has been completed. The other, "The Amount and Variation of Runoff in Alberta, Saskatchewan and Manitoba", is nearing completion.





Marking soil cores for identification at the Soil Mechanics and Materials Division Laboratory in Saskatoon.

Ref. No. 21732

In addition, a meteorologist seconded to the P. F. R. A. Hydrology Division by the Department of Transport, has recently completed a depth-area-duration analysis for all great prairie rainstorms during the last 60 years. Studies are being made, using the rainstorm analysis, to obtain information for the design of major spillways. Concurrently, a study of the magnitude and frequency of point rainfall (10 square miles and less) is being made to obtain design figures for small watersheds.

### Surveys

Surveys play an essential and large role in providing the necessary field data required in planning, designing and constructing P. F. R. A. projects. Operations in this category within P. F. R. A. include engineering investigations and legal surveys.

Engineering surveys include reconnaissance, preliminary and final surveys and are carried out as a routine phase of investigation and construction of structures and projects built by P. F. R. A. As a valuable aid in this work, aerial photography is being used increasingly to obtain necessary preliminary topographical information where large areas are involved. Further details of engineering surveys carried out by the Engineering Services Branch during 1961 are discussed in other sections of this report under the heading of the project concerned.

Activities of the Legal Surveys Section during the year included assignments both in Saskatchewan and Alberta.



In Saskatchewan most of the work done by the Legal Surveys Section consisted of a complete revision survey of the Consul Irrigation Project, together with miscellaneous revision, reservoir and structure rights-of-way surveys on the Val Marie and Nashlyn Irrigation Projects. Also carried out during 1961 were seven reservoir surveys on the Pasquia, Poplar River, Birch Hills, Antler Creek, Cleland, Oungre and Craik Community Projects, two road surveys on the Rush Lake and Nashlyn Irrigation Projects, and monument re-establishment and parcel surveys on the Tecumseh and Big Stick community pastures respectively. In addition, survey monuments were restored or re-established on the Avonlea Creek Project, and the west portion of Kettlehut Lake Dam and Reservoir was surveyed for expropriation. Finally, on the South Saskatchewan River Project a plan was completed showing the lake line and Crown Land for the reservoir to be created by the main dam of the South Saskatchewan River. This was necessitated by a request received for a full legal survey to be conducted in the area.

Activities in Alberta mainly involved a continuation of surveys on the St. Mary and Bow River Irrigation Projects associated with irrigation development in these areas. During 1961 this included carrying out approximately 70 miles of right-of-way traverse and 27 miles of drainage canal and pipeline right-of-way surveys for the Province of Alberta on the St. Mary Irrigation Project, and traverse, boundary and subdivision surveys in the Hays district of the Bow River Project. Surveys on the Blood Indian Reserve involved establishing township subdivision survey monuments and right-of-way monuments, and establishing survey ties to photograph 20 thousand acres of the Blood Indian Reserve for the Air Photo Analysis and Engineering Geology Division.

Following February 15, 1962, the Lethbridge survey office that served the Alberta area was closed. Survey work required in Alberta will be contracted out to private firms.

# APPENDIX I

## WATER DEVELOPMENT PROGRAM

Progress by Years in the Construction of Individual, Neighbor and Community Projects

Number of Projects Constructed				Financial Assistance Paid				
Fiscal Yr.	DO	SWD	IRR	TOTAL	DO	SWD	IRR	TOTAL
*1935-48	29,907	5,013	1,144	36,064	3,252,722.44	685,654.65	272,970.51	4,211,347.60
1948-49	1,508	220	77	1,805	171,566.42	319,540.09	365,241.68	856,348.19
1949-50	3,031	164	123	3,318	367,392.80	214,973.66	220,242.50	802,608.96
1950-51	3,442	494	721	4,657	408,385.52	295,594.47	237,892.22	941,872.21
1951-52	478	106	350	934	60,051.14	95,488.30	171,773.19	327,312.63
1952-53	861	119	290	1,270	100,219.54	32,769.41	116,672.07	249,661.02
1953-54	1,791	190	187	2,168	227,372.12	126,415.05	209,287.59	563,074.76
1954-55	1,314	242	193	1,749	161,716.42	201,457.82	122,534.03	485,708.27
1955-56	504	159	114	777	68,141.55	78,443.87	87,547.88	234,133.30
1956-57	863	131	114	1,108	112,268.86	46,272.04	157,803.10	316,344.00
1957-58	2,218	225	155	2,598	268,273.35	143,319.23	90,787.91	502,380.49
1958-59	3,288	281	168	3,737	411,791.24	135,211.03	97,049.58	644,051.85
1959-60	3,974	259	136	4,369	820,479.90	98,981.43	70,894.59	990,355.92
1960-61	4,602	501	170	5,273	990,874.56	118,308.58	76,121.89	1,185,305.03
1961-62	9,249	297	154	9,700	2,035,757.87	108,058.79	76,374.39	2,220,191.05
TOTAL	67,030	8,401	4,096	79,527	9,457,013.73	2,700,488.42	2,373,193.13	14,530,695.28

DO – Dugout

SWD – Stockwatering Dam

IRR – Individual Irrigation Project

\* – Annual figures for accumulated years may be found in previous reports



# APPENDIX II

## WATER DEVELOPMENT PROGRAM

Number of Individual, Neighbor, Community and Large Water Development Projects and amount of financial assistance paid from April 1, 1961 to March 31, 1962

		DUGOUTS			DAMS			IRRIGATION PROJECTS			TOTALS	
		Projects Paid	Financial Assistance Paid	Projects Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Projects Paid	Financial Assistance Paid	Projects Paid		
<b>MANITOBA</b>												
Individual	1,789	386,430.49		3		838.84	4		3,068.57	1,796	390,337.90	
Neighbor	2	1,427.77		-		-	-		-	2	1,427.77	
Community	-	-		-		-	-		-	-	-	
Large Water	-	-		4		163,088.00	-		-	4	163,088.00	
<b>TOTAL</b>	<b>1,791</b>	<b>387,858.26</b>		<b>7</b>		<b>163,926.84</b>	<b>4</b>		<b>3,068.57</b>	<b>1,802</b>	<b>554,853.67</b>	
<b>SASKATCHEWAN</b>												
Individual	5,520	1,209,585.04		150		32,402.65	101		40,121.76	5,771	1,282,109.45	
Neighbor	42	17,933.00		2		199.56	11		8,849.70	55	26,982.26	
Community	25	35,902.12		8		36,660.41	1		10,149.82	34	82,712.35	
Large Water	-	-		5		215,416.00	-		-	5	215,416.00	
<b>TOTAL</b>	<b>5,587</b>	<b>1,263,420.16</b>		<b>165</b>		<b>284,678.62</b>	<b>113</b>		<b>59,121.28</b>	<b>5,865</b>	<b>1,607,220.06</b>	
<b>ALBERTA</b>												
Individual	1,851	349,419.95		129		25,978.54	37		14,184.54	2,017	389,583.03	
Neighbor	3	2,306.92		-		-	-		-	3	2,306.92	
Community	17	32,752.58		5		11,978.79	-		-	22	44,731.37	
Large Water	-	-		1		31,463.00	-		-	1	31,463.00	
<b>TOTAL</b>	<b>1,871</b>	<b>384,479.45</b>		<b>135</b>		<b>69,420.33</b>	<b>37</b>		<b>14,184.54</b>	<b>2,043</b>	<b>468,084.32</b>	
<b>GRAND TOTAL</b>	<b>9,249</b>	<b>2,035,757.87</b>		<b>307</b>		<b>518,025.79</b>	<b>154</b>		<b>76,374.39</b>	<b>9,710</b>	<b>2,630,158.05</b>	

WATER DEVELOPMENT PROGRAM

Number of Individual, Neighbor, Community and Large Water Development Projects and amount of financial assistance paid from April 1, 1935 to March 31, 1962

DUGOUTS				DAMS		IRRIGATION PROJECTS		TOTALS	
	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	
MANITOBA									
Individual	14,367	1,761,484.12	331	27,461.77	195	68,003.94	14,893	1,856,949.83	
Neighbor	65	15,282.63	15	4,496.20	8	2,212.62	88	21,991.45	
Community	7	12,530.86	24	131,160.47	2	30,582.54	33	174,273.87	
Large Water	-	-	24	1,444,778.82	6	617,217.00	30	2,061,995.82	
TOTAL	14,439	1,789,297.61	394	1,607,897.26	211	718,016.10	15,044	4,115,210.97	
SASKATCHEWAN									
Individual	42,279	5,778,917.20	4,876	461,263.80	2,497	614,170.29	49,652	6,854,351.29	
Neighbor	381	113,083.31	58	12,689.95	116	56,153.03	555	181,926.29	
Community	346	307,289.63	194	1,025,409.64	68	654,793.34	608	1,987,492.61	
Large Water	-	-	42	3,351,283.37	35	4,079,910.00	77	7,431,193.37	
TOTAL	43,006	6,199,290.14	5,170	4,850,646.76	2,716	5,405,026.66	50,892	16,454,963.56	
ALBERTA									
Individual	9,474	1,325,318.58	2,773	294,738.77	1,142	281,782.66	13,389	1,901,840.01	
Neighbor	44	14,094.03	14	3,960.99	15	5,033.69	73	23,088.71	
Community	67	129,013.37	116	739,306.83	53	660,461.02	236	1,528,781.22	
Large Water	-	-	5	58,095.00	18	693,004.00	23	751,099.00	
TOTAL	9,585	1,468,425.98	2,908	1,096,101.59	1,228	1,640,281.37	13,721	4,204,808.94	
GRAND TOTAL	67,030	9,457,013.73	8,472	7,554,645.61	4,155	7,763,324.13	79,657	24,774,983.47	



APPENDIX IV  
COMMUNITY WATER STORAGE AND IRRIGATION PROJECTS  
To March 31, 1962

(Community Projects costing less than \$1,000.00 are grouped under the heading of Small Community Projects in Appendices II and III)

MANITOBA

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Alexander Soil Conservation	Alexander	Soil Conservation	1944	—	—	5,250
Birtle Dam	Birtle	Stockwatering Dam	1947	—	—	11,490
Boissevain	Boissevain	Storage Dam	1954	—	580	29,992
Boissevain Spillway	Boissevain	Spillway	1961	—	—	20,782
Brandon Flood Irrigation	Brandon	Flood Irrigation	1949	1,000	—	27,107
Brandon Water Supply	Brandon	Storage Dam	1940	—	500	3,996
Clearwater Storage	Clearwater	Stockwatering Dam	1938	—	12	5,949
Crystal City Storage	Crystal City	Stockwatering Dam	1935	—	3	3,334
Dead Lake Community	Gladstone	Irrigation	1950	20	90	1,933
Deloraine Dam	Deloraine	Storage Reservoir	Incomplete	—	1,400	1,575
Edwards, R.M. of	Melita	Stockwatering Dam	1935	—	100	10,214
Elie Dam	Elie	Stockwatering Dam	Incomplete	—	109	300
Hague Dam	Sanford	Stockwatering Dam	1953	—	—	29,183
Hampson Dam	Sanford	Storage Dam	1954	—	420	16,899
Hartney	Hartney	Irrigation	1941	—	—	10,264
Killarney	Killarney	Multi-purpose Dam	1956	—	800	41,965
LaSalle River Dams	LaSalle	Stockwatering Dam	1941	—	900	22,989
LaSalle River Dam #2	LaSalle	SWD & Domestic	1961	—	260	36,531
Lewko Dam	Sanford	Storage Dam	1954	—	320	20,874
Little Souris River Dam	Melita	Stockwatering Dam	1945	—	250	1,380

Name of Project	Location	Type of Project	Completed	Irr. Acc.	Stor. Cap. Acre Feet	Costs
Mary Jane Storage Project	Manitou	Multi-purpose Dam	1959	—	1,150	96,045
McAuley Community Dam	McAuley	Stockwatering Dam	1955	—	20	2,051
Melita	Melita	Irrigation	1941	3,900	3,200	11,372
Minnedosa Dam	Minnedosa	Storage Dam	1950	20	1,500	105,051
Morden Dam (Dead Horse Creek)	Morden	Irrigation	1941	100	1,200	344,274
Morris River Dams (3)	Morris	Stockwatering Dams	1960	—	207	64,232
Morris River-Rock Lake	Carmen	Stockwatering Dam	1940	—	10,000	23,401
Napinka	Napinka	Irrigation	1941	—	—	6,770
Neepawa Storage Project	Neepawa	Multi-purpose Dam	1960	—	4,000	345,238
Oak Lake	Oak Lake	Irrigation	1956	13,000	—	119,205
Park Lake	Neepawa	Stockwatering	1953	—	—	21,626
Perry Park Dam	Westbourne	SWD & Domestic	1961	—	70	30,627
Plum Coulee	Plum Coulee	Multi-purpose Res.	1957	—	12	5,939
Plumas	Plumas	Multi-purpose Dam	1960	—	30	2,991
Plumas	Plumas	Stockwatering Dam	1961	—	14	18,685
Rivers Dam	Rivers	Multi-purpose Res.	1960	—	26,000	1,085,392
Roland	Roland	Stockwatering Dugout	1957	—	1.5	1,000
Rosebank Dam	Rosebank	Stockwatering	1948	—	32	12,161
Roseau River Dam	Dominion City	Multi-purpose Dam	1957	—	—	54,705
Shoal Lake Project	Shoal Lake	Stockwatering	1948	—	3,500	8,491
Souris Dam	Souris	Multi-purpose Dam	1952	—	150	73,597
Souris, Town of	Souris	Stockwatering Dam	1935	—	150	3,841
St. Malo Dam	St. Malo	Multi-purpose Dam	1958	—	1,770	266,937
St. Lazare Storage Reservoir	Lazare	Stockwatering	1948	—	5	1,470
Starbuck Dam	Starbuck	Stockwatering	1961	—	712	46,187
Turtle Mountain Reservoir	Boissevain	Multi-purpose Res.	1956	70	600	11,968



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Wawanesa	Wawanesa	Irrigation	1941	—	—	125,332
Westbourne, R.M. of	Gladstone	Stockwatering	1947	—	—	5,993
Whitemud River	Woodside	Stockwatering	1949	—	160	6,506
Whitemud River Storage	Gladstone	Stockwatering Dam	1943	—	660	11,464
SASKATCHEWAN						
Abbey	Abbey	Stockwatering Dugout	1958	—	1.5	1,000
Abound	Caron	Multi-purpose Res.	1960	—	200	5,210
Adair Creek	Wolseley	Multi-purpose Dam	1956	40	350	59,849
Adam's Lake	Battle Creek	Irrigation	1936	1,500	2,000	8,831
Admiral Storage Dam	Admiral	Irr. & Stockwatering	1949	2,000	2,200	38,520
Allan	Allan	Stockwatering	1948	—	300	4,477
Altawan	Govenlock	Irrigation	1960	1,000	5,830	261,479
Alsask	Alsask	Multi-purpose Res.	1958	—	30	9,710
Antler Creek Project	Carnduff	SWD & Domestic	1961	—	790	54,141
Arcola	Arcola	Stockwatering Dam	1939	—	(underground)	17,310
Arena	Arena	Irr. & Stockwatering	1949	1,600	3,200	5,218
Arm River, R.M. of	Davidson	Dugout	1961	—	—	1,000
Arrarat	Abbey	Stockwatering Dam	1959	—	6	7,398
Artland Grazing	Marsden	Dugout	1955	—	1.5	1,000
Avon Heights Grazing Co-op.	Shaunavon	Stockwatering	1955	—	60	2,428
Avonhurst	Qu'Appelle	Stockwatering	1956	—	1.5	3,200
Avonlea	Avonlea	Dugout	1959	—	3	2,170
Aylesbury	Craik	Stockwatering Dam	1961	—	40	1,265

Balcarres	Balcarres	Stockwatering	1948	—	100	7,203
Balcarres Storage	Balcarres	Stockwatering	1953	—	20	10,294
Bateman	Gravelbourg	Irr. & Stockwatering	1949	400	114	4,739
Battleford	N. Battleford	Irrigation (pump)	1941	800	—	3,058
Beadle	Eston	Dugout	1959	—	3	1,393
Beadle Project	Eston	Dugout	1960	—	—	1,393
Beaver Creek	Hanley	Stockwatering	1951	—	200	7,998
Beechy #1	Beechy	Irr. & Stockwatering	1946	600	1,000	12,746
Beechy #2	Beechy	Irr. & Stockwatering	1948	200	100	6,240

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Beechy Co-op. Belvoir	Beechy Glamis	Stockwatering Dugout Dugout	1957 1959	- -	1.5 3	1,000 1,484
Bengough Agricultural Community Project	Bengough	Dugout	1960	-	-	1,000
Bengough, R.M. of Big Arm Storage	Bengough Liberty	Stockwatering Dugout Irrigation	1957 1939	- 5,000	1.5 5,200	1,000 13,161
Big Stick Stockmen's Co-op. Assoc. Ltd.	Maple Creek	Dugouts (3)	1961	-	-	2,567
Birch Hills	Birch Hills	Dugout	1961	-	125	36,152
Black Hills Grazing Co-op.	Piapot	Dugout	1955	-	5	2,520
Boharm	Boharm	Stockwatering	1948	-	100	6,250
Bracken	Bracken	Stockwatering	1946	-	158	1,001
Braddock Dam	Braddock	Irrigation	1952	2,000	1,600	83,999
Brightwater Creek	Hanley	Irrigation	1956	2,500	3,500	11,713
Brightwater Lake	Dundurn	Irrigation	1960	7,000	-	12,211
Brown Hill Dam	Grenfell	Multi-purpose Dam	1958	-	275	99,394
Buffalo Pound	Qu'Appelle Valley	Irrigation	1940	x	-	83,723
Buffalo Valley	Wiseton	Dugout	1960	-	-	1,000
Burstall	Burstall	Dugout	1960	-	-	1,500

Cabri	Cabri	Stockwatering	1948	-	340	37,553
Cabri Dam (Spillway)	Cabri	Stockwatering	1960	-	340	29,107
Cadillac	Cadillac	Irrigation	1945	800	1,350	32,887
Camberly	Camberly	Irrigation & Dam	1950	-	100	2,106
Canora	Canora	Storage Dam	1941	-	300	16,128
Caron	Caron	Storage	1948	-	100	17,109
Caron Water Development	Thunder Creek	Storage Dam	1944	-	43,500	710,433
Cedoux	Cedoux	Stockwatering	1947	-	314	4,999
Ceylon Reservoir	Ceylon	Irrigation & Dam	1952	300	250	8,087
Chapleau Lake	Montmartre	Stockwatering	1949	-	3,530	8,208
Clair Creek	Wadena	Flood Irrigation	1957	100	-	1,877
Claydon	Claydon	Multi-purpose Res.	1957	-	30	2,498
Claydon Grazing Co-op.	Claydon	DO & Stockwatering	1961	-	-	1,750
Claydon	Claydon	Irrigation	1959	700	300	7,015



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Clearfield	Goodwater	Irrigation & Dam	1951	70	300	5,999
Cleland Dam	Marriott	Stockwatering Dam	1961	—	210	35,949
Colgate	Colgate	Flood Irrigation	1958	320	—	7,110
Conquest, Village of	Conquest	Dugout	1954	—	1.5	1,000
Congress-Stonehenge	Limerick	Stockwatering Dugout	1958	—	2	1,000
Consul-Vidora	Vidora	Irrigation	1950	3,000	—	62,500
Corning Dam	Corning	Stockwatering Dam	1961	—	250	8,264
Coral	Trossachs	Stockwatering Dam	1961	—	150	7,626
Coronach	Coronach	Irrigation & Dam	1947	300	1,450	97,807
Craven Dam	Qu'Appelle Valley	Irrigation	1943	x	—	33,675
Crooked & Round Lake	Qu'Appelle Valley	Irrigation	1941	x	—	48,650
Cypress Storage	Ravenscrag	Irrigation	1939	20,000	80,000	467,691
Coleville, Village of	Coleville	Dugout	1958	—	1.5	1,000
Coleville	Coleville	Dugout	1961	—	—	1,500
Cupar	Cupar	Irrigation	1960	3,000	—	6,733
Cupar	Cupar	Irrigation	1961	500	—	9,558
Cupar, R.M. of	Markinch	Dugouts (4)	1961	—	—	1,650

1 55 1

Dalmeny	Dalmeny	Stockwatering	1951	—	3	1,000
Davidson	Davidson	Irrigation	1937	100	277	3,114
Davidson Storage Project	Davidson	Multi-purpose Dam	1959	—	400	36,006
Davin	Kronau	Stockwatering	1947	—	1,080	13,501
Dead Lake	Macoun	Irrigation	1941	Souris River Development		
Delisle	Delisle	Stockwatering	1950	—	45	17,528
Demaine	Demaine	Dugout	1960	—	—	4,899
Dixson Lake	Spring Valley	Irrigation	1959	500	—	1,000
Donamar	Fort Qu'Appelle	Stockwatering Dam	1961	—	2,500	13,951
Doonside Dam	Wawota	Irrigation	1955	1,500	60	4,442
Downey Lake	Maple Creek	Stockwatering Dam	1958	—	1,500	3,438
Dry Coulee	Eastend	Stockwatering Dam	1958	—	58	1,404
Dry Lake	Forward	Stockwatering	1949	—	10	1,605
Dunn & Watt	Mankota	Irrigation	1937	—	600	9,729
Dunning	Radville	Irrigation	1951	305	—	2,996
Dummer	Milestone	Irrigation & Dam	1949	120	200	3,566
Dodsland	Druid	Dugout	1958	500	200	4,742
				—	1.5	1,000

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Eagle Hill Creek	Plenty	Stockwatering	1946	—	10,700	6,432
Eagle Lake	Coleville	Irrigation & Dam	1949	2,000	3,000	5,998
Eastend	Eastend	Irrigation	1939	4,000	1,300	161,682
Eastview	Eastview	Stockwatering	1949	—	200	5,970
Eatonia	Eatonia	Stockwatering	1949	—	12	1,199
Echo Lake	Qu'Appelle Valley	Irrigation	1943	x	—	41,753
Egg Lake	Avonhurst	Multi-purpose Res.	1957	800	—	10,047
Elfros	Elfros	Stockwatering	1949	—	25	7,330
Elfros, R.M. of	Elfros	Dugouts (2)	1961	—	—	1,000
Emerald Hill	Milestone	Stockwatering	1958	—	250	7,582
Eston	Eston	Stockwatering	1954	—	10	11,469
Fahlman's Creek Project						
Fairy Hill	Balgonie	Stockwatering	1949	—	400	15,599
Fairview, R.M. of	Qu'Appelle Valley	Irrigation	1941	x	—	4,302
Fife Lake Restoration	Fairview	Dugout	1961	—	—	2,000
Fife Lake #2	Constance	Irrigation & Dam	1954	1,200	—	9,596
Fillmore	Constance	Irrigation & Dam	1954	650	—	6,348
Fleming	Fillmore	Stockwatering Dugout	1958	—	1.5	1,000
Fleming Creek	Fleming	Dugout	1960	—	—	1,000
Foam Lake (Elfros)	Moosomin	Stockwatering	1950	—	75	3,282
Francis Lake	Foam Lake	Irrigation	1957	4,000	—	11,964
Frenchman Flats	Morse	Irrigation	1956	1,560	—	17,305
Frenchville	Dundurn	Irrigation	1949	1,800	2,800	9,996
Fox Valley, R.M. of	Frenchville	Irrigation & Dam	1947	430	670	8,096
	Fox Valley	Dugouts (2)	1961	—	—	1,953
Gibson Flats	Pennant	Irrigation	1953	1,200	—	14,177
Girvin	Girvin	Stockwatering Dam	1937	—	19	2,180
Glenbain, R.M. of	Glenbain	Dugout	1961	—	—	1,000
Glenside	Glenside	Stockwatering	1948	—	150	3,286
Glidden, Village of	Glidden	Dugout	1959	—	3	1,200
Gooseberry Lake	Corning	Stockwatering	1948	—	2,500	8,783
Gouverneur Dam	Ponteix	Irrigation	1952	6,000	10,000	242,468
Graham-Rogers	Qu'Appelle	Irrigation	1959	500	—	2,780



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Store. Cap. Acre Feet	Costs
Grattle Grazing Co-op.	Hoosier	Dugout	1960	-	3	1,495
Gravelbourg South	Gravelbourg	Irrigation	1948	600	1,500	8,186
Gravelbourg Storage	Gravelbourg	Irrigation	1947	500	-	1,917
Grazing Co-op. #76	Piapot	Dugouts (4)	1961	-	-	4,800
Grosnick	Lake Alma	Stockwatering Dugout	1957	-	1.5	1,000
Gunn Grazing Co-op.	Shaunavon	Multi-purpose Res.	1957	-	10	1,632
Gull Lake	Gull Lake	Multi-purpose Res.	1960	-	80	1,850
Hague Dugout	Hague	Stockwatering	1950	-	2	1,000
Hazlet	Hazlet	Multi-purpose Dam	1960	-	500	3,550
Hodgeville	Hodgeville	Stockwatering	1949	-	5	2,748
Hanley	Hanley	Stockwatering	1946	-	60	3,797
Harris Reservoir	Maple Creek	Irrigation	1956	1,000	5,000	238,074
Haunted Hill's Grazing Co-op.	Moose Jaw	Stockwatering Dam	1959	-	10	1,640
Haunted Hills Grazing Co-op.	Moose Jaw	Dugout	1961	-	-	1,101
Hoosier, Hamlet of	Hoosier	Dugout	1959	-	3	1,190
Hugonard Coulee Dam	Lebret	Multi-purpose Dam	1956	100	400	64,231
Jackfish Creek	Meota	Stockwatering Dam	1943	-	90	2,940
Jumping Deer Creek	Lipton	Stockwatering	1947	-	145	6,092
Kaposvar	Stockholm	Stockwatering	1947	-	290	11,946
Kaposvar Creek	Melville	Stockwatering Dam	1954	-	1,400	102,747
Katepwa Weir	Katepwa	Dam	1957	-	-	61,192
Kelfield	Kelfield	Stockwatering	1947	-	25	4,927
Kerrobart	Kerrobart	Multi-purpose Res.	1957	-	40	11,554
Keyser	Cupar	Stockwatering Dam	1961	-	80	5,427
Kincaid	Kincaid	Stockwatering	1956	-	10	2,539
Kindersley, R.M. of	Kindersley	Dugout	1961	-	-	2,000
Kindersley	Kindersley	Stockwatering	1949	-	300	2,007
Kettlehut Reservoir	Kettlehut	Stockwatering Dam	Incomplete	-	-	2,687
Kisbey Flats	Kisbey	Irrigation	1939	2,300	5,000	23,211
Koch-Froh	Qu'Appelle	Multi-purpose Res.	1956	160	-	2,390

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Lac Pelletier	Lac Pelletier	Stockwatering Dam	1937	-	3,350	2,139
Lacadena	Lacadena	Irrigation	1954	-	-	9,678
Lafleche	Lafleche	Stockwatering Dam	1940	-	38	2,524
Lafleche Dam	Lafleche	Multi-purpose Dam	1957	15,000	30,120	627,922
Lajord	Lajord	Dam	1936	-	300	13,800
Lake of the Rivers	Assibinoia	Stockwatering Dam	1938	-	300	10,805
Lancer Water Users	Lancer	Irrigation	1953	1,265	-	35,000
Langenburg	Langenburg	Irrigation & Dam	1949	800	200	11,752
Langenburg	Langenburg	Irrigation	1954	-	2.5	3,000
Larsen	Radville	Multi-purpose Dam	1957	-	500	36,437
Last Mountain Lake	Qu'Appelle Valley	Irrigation	1941	x	-	42,721
Lebret	Qu'Appelle Valley	Irrigation	1941	x	-	16,307
Lemsford	Lemsford	Stockwatering Dugout	1957	-	1.5	1,000
Linacre Co-op.	Fox Valley	Dugout	1960	-	-	1,100
Little Manitou Lake	Watrous	Dam	1957	-	-	39,271
Lone Tree Municipality	Climax	Dugout	1960	-	-	1,200
Lonesome Lake	Vidora	Irrigation	1949	900	800	2,771
Long Creek #1	Estevan	Stockwatering Dam	1938	-	137	8,729
Long Creek #2	Estevan	Stockwatering Dam	1938	-	90	8,701
Longlaketon, R.M. of	Earl Grey	Dugouts (2)	1961	-	-	1,100
Longlaketon, R.M. of	Earl Grey	Dugouts (2)	1961	-	-	1,000
Loon Creek	Markinch	Stockwatering Dam	1945	-	700	7,180
Lucky Lake	Lucky Lake	Stockwatering	1946	-	120	7,596
McIntosh Slough	Golden Prairie	Irrigation	1949	500	1,500	1,990
Macklin Storage	Macklin	Stockwatering	Incomplete	-	40	967
Mankota, R.M. of	Mankota	Dugouts (2)	1961	-	-	2,062
Maple Creek	Maple Creek	Irrigation	1938	10,000	23,260	356,179
Maple Grove	Goodwater	Dam	1959	-	330	5,988
Marcelin	Blaine Lake	Dugout	1961	-	-	1,000
March Flood Irrigation	Cedoux	Irrigation	1948	400	-	1,765
Markinch South	Markinch	Irrigation	1961	350	-	3,223
Martin Co-op.	Maple Creek	Dugout	1960	-	-	4,230
Masefield	Masefield	Stockwatering	1938	-	40	3,187



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Masefield Water Users	Masefield	Multi-purpose Dam	1957	500	250	7,999
Matador	Matador	Irrigation & Dam	1946	120	220	5,216
Maymont	Maymont	Dugout	1959	-	1.5	1,200
Maxim Lake	Maxim	Stockwatering	1949	-	5,000	20,472
McCraney, R.M. of	Kenaston	Stockwatering Dam	1937	-	350	1,896
McDonald Creek	McCord	Irrigation & Dam	1950	400	90	4,992
McGurk Lake	Carlyle	Dam	1960	-	2,000	3,128
Meadowland	Macklin	Irrigation	1954	500	-	6,370
Meeting Lake	Redfield	Stockwatering	1949	-	100	2,683
Melaval	Melaval	Stockwatering	1950	-	18	1,200
Meota, R.M. of	Meota	Dugout	1953	-	1.5	1,000
Middle Creek	Battle Creek	Irrigation	1937	1,000	20,000	18,663
Mine Coulee	Neptune	Stockwatering	1948	-	40	4,377
Miry Creek, R.M. of	Abbey	Dam	Incomplete	-	20	4,680
Montague Lake	Assiniboia	Irrigation	1953	235	-	1,000
Moose Jaw Creek	Lang	Irrigation	1938	2,250	2,180	7,618
Moose Mountain	Corning	Irrigation	1937	-	8,000	14,829
Moosomin Dam (Keenan Bridge)	Moosomin	Multi-purpose Dam	1954	-	9,000	449,184
Muenster	Muenster	Irrigation	1949	25	11	2,754
Muenster	Muenster	Multi-purpose Dam	1960	-	80	8,085
Nashlyn Irrigation	Consul	Irrigation	1961	1,000	-	39,944
Neudorf	Neudorf	Multi-purpose Res.	1958	-	-	1,790
Newburn Lake	Invermay	Irrigation & Dam	1952	50	1,280	6,477
North Herbert Extension	Herbert	Irrigation	Incomplete	-	-	511,909
North Portal	North Portal	Dugout	1959	-	2	1,810
North Qu'Appelle	Fort Qu'Appelle	Stockwatering Dam	1948	-	100	2,386
Oakdale Municipality	Coleville	Dugout	Incomplete	-	-	1,020
Orkney	Orkney	Stockwatering Dam	1958	-	10	1,982
Oxbow Dam	Oxbow	Irrigation	1941	3,900	3,200	17,436
Oungre Dam	Oungre	Stockwatering Dam	1961	-	325	45,830

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Pangman	Pangman	Multi-purpose Res.	1957	30	125	5,533
Pasqua	Moose Jaw	Stockwatering	1948	—	40	3,777
Pike Lake	Vanscoy	Irrigation & Dam	1948	900	2,500	7,360
Pinkham Co-op.	Pinkham	Dugout	1960	—	—	1,497
Pinkham Project	Kindersley	Dugout	1960	—	—	1,000
Pinto Creek	Kincaid	Dugout	1960	—	—	1,000
Pipestone Lake	Broadview	Stockwatering Dam	1938	—	1,600	11,785
Pheasant Creek	Lemberg	Storage	1954	—	500	114,464
Poplar River	Coronach	Irrigation & Dam	1950	300	900	14,838
Portreeve	Portreeve	Stockwatering Dugout	1957	—	1.5	1,000
Primate	Primate	Stockwatering Dugout	1957	—	1.5	1,000
Prud'homme	Prud'homme	Dugout	1961	—	—	1,000
Radville	Radville	Stockwatering	1947	—	32	5,019
Reciprocity	Glen Ewen	Irrigation & Dam	1949	2,000	1,750	27,410
Redford	Wilkie	Stockwatering	1951	—	160	1,814
Richman Irrigation	Glen Bain	Irrigation	1949	—	1,000	4,607
Richardson-McKinnon	Consul	Irrigation	1946	3,000	—	53,913
Ridgeway Flats	Qu'Appelle	Multi-purpose	1957	65	80	2,054
Rinfret	Weyburn	Dugout	1959	—	6	6,997
Rockglen	Rockglen	Irrigation & Dam	1955	600	300	13,455
Rosedale	Hanley	Irrigation	1948	60	100	1,016
Rosthern Water Storage	Rosthern	Storage Dam	1958	—	160	22,613
Rough Bark Creek	Goodwater	Stockwatering Dam	1937	—	1,500	9,314
Round Hill Water Users	N. Battleford	Irrigation & Dam	1950	425	50	4,791
Ruddell, Village of	Ruddell	Dugout	1959	—	1.5	1,000
Russell Creek	Pambrun	Irrigation	1951	1,000	2,000	72,993
Rockfield	Trossachs	Multi-purpose Res.	1960	—	200	6,850
Saline	Invermay	Multi-purpose Res.	1958	1,000	—	2,377
Saltcoats	Bredenbury	Dugout	1960	—	—	1,000
Saltcoats, R.M. of	Saltcoats	Dugout	1961	—	—	1,000
Salvador	Reward	Stockwatering	1951	—	5	1,000
Saskatoon	Saskatoon	Storage Dam	1940	—	1,200	290,446



Sauder	Rush Lake	Storage & Irrigation	1949	-	800	29,115
Scotsguard	Scotsguard	Irrigation & Dam	1949	2,000	3,000	1,962
Scotsguard	Shaunavon	Stockwatering Dugout	1960	-	-	2,800
Scotsguard	Shaunavon	Stockwatering Dugout	1958	-	3	1,857
Shaheen	Rush Lake	Storage & Irrigation	1949	-	300	9,028
Shackleton, Village of	Shackleton	Dugout	1959	-	1.5	1,500
Shrimp Lake	Herschel	Stockwatering	1947	-	450	9,367
Sinfield	Kelvington	Multi-purpose Res.	1957	10	-	3,177
Skyeta, Com.	Springside	Dam	1959	-	15	3,885
Sioux Reserve	Fort Qu'Appelle	Stockwatering	1949	-	75	8,605
Sliding Hills Municipality	Veregin	Dugout	1960	-	-	1,000
Smiley, Village of	Smiley	Dugout	1949	-	1.5	1,000
Smiley	Smiley	Irrigation & Dam	1951	600	300	9,998
Snake Bite	Beechy	Irrigation	1954	665	-	9,999
Snipe Lake	Eston	Stockwatering	1949	-	-	3,415
Snowdown Grazing Co-op.	Fox Valley	Dugout	1959	-	1.5	1,898
Snowdown Grazing Co-op.	Fox Valley	Dugouts (5)	1961	-	-	3,000
Souris-Estevan	Estevan	Irrigation	1941	-	-	91,133
Souris-Oxbow Weir	Oxbow	Stockwatering	1960	-	340	37,343
Souris River	Weyburn	Flood Control	1948	-	-	11,998
South Abernethy Project	Abernethy	Irrigation	1956	320	-	14,568
Spangler Project	Govenlock	Irrigation	1948	1,500	2,100	4,950
Squaw Creek Grazing Co-op.	Craik	Dugout	1961	-	-	1,000
Stelcam Community Dam	Stelcam	Stockwatering	1956	-	360	9,791
Stephens Dam	Abernethy	Stockwatering	1948	-	12	8,716
Sturgis Community Dam	Sturgis	Stockwatering	1950	-	60	20,961
Summerberry	Summerberry	Multi-purpose Res.	1956	427	-	6,824
Summercove	Mankota	Irrigation & Dam	1949	1,200	1,500	23,837
Summit Creek	Bridgeford	Irrigation & Dam	1949	800	3,000	13,227
Sunbeam Creek	Indian Head	Multi-purpose Res.	1957	100	300	5,216
Swift Current	Swift Current	Irrigation	1946	30,000	95,000	816,472
Talmage	Cedoux	Irrigation	1948	1,600	-	3,483
Tantallon	Tantallon	Stockwatering Dam	1942	-	-	2,790

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Tatagwa Lake	Weyburn	Flood Irrigation	1958	10,000	-	28,840
Terrell, R.M. of	Spring Valley	Stockwatering	1952	-	10	2,491
Thunder Creek	Kettlehut	Flood Irrigation	1948	-	-	27,204
Thunder Creek Channel	Moose Jaw	Irrigation & Dam	1951	300	7,000	10,007
Tilney	Tilney	Multi-purpose Res.	1958	-	100	8,308
Torquay Dam	Torquay	Stockwatering Dam	1961	-	280	8,287
Tribune Dam	Tribune	Stockwatering	1950	-	300	6,499
Truax	Truax	Stockwatering	1949	-	250	11,899
Tuxford	Tuxford	Flood Irrigation	1957	800	-	7,320
Twelve Mile Lake	Maxstone	Flood Irrigation	1956	-	-	7,998
Tyvan	Tyvan	Stockwatering	1947	-	1,000	11,986
Val Marie	Val Marie	Irrigation	1937	5,920	7,000	214,558
Val Marie West (including new Spillway 1959)	Val Marie	Irrigation	1940	4,230	2,000	321,586
Valeport Dyke	Valeport	Dam	1958	1,500	-	139,748
Valley Park Irrigation	Valley Lake	Irrigation	1949	1,200	-	8,133
Verwood	Verwood	Stockwatering Dam	1958	-	16	1,414
Weed Creek	Broadview	Flood Irrigation	1958	2,000	-	3,099
West Osage	Cedoux	Irrigation & Dam	1949	300	600	4,905
West Poplar #1	Kildeer	Multi-purpose Res.	1957	750	1,000	16,230
Weyburn	Weyburn	Irrigation	1940	-	4,000	51,311
Wheatlands, R.M. of	Parkbeg	Irrigation & Dam	1951	100	60	3,452
White Gull Lake	Gull Lake	Flood Irrigation	1958	263	-	1,743
Willow Bluff Grazing Co-op.	Aylesbury	Dugouts (2)	1961	-	-	1,000
Wilson Lake	Lizard Lake	Multi-purpose Res.	1956	400	-	2,813
Wittrock	Hodgeville	Irrigation	1947	520	-	3,884
Wolseley	Wolseley	Stockwatering	1948	-	20	1,800
Wolverine Creek	Humboldt	Stockwatering Dam	1945	-	522	52,600
Wood Mountain	Willow Bunch	Irrigation & Dam	1951	40	60	6,337
Woodrow-Pinto Creek	Woodrow	Irrigation	1949	1,000	1,400	41,982
Wood River Development	Coderre and Gravelbourg	Stockwatering Dam	1942	-	4,923	33,738



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Wynn Community Project	Wolseley	Multi-purpose Res.	1957	500	-	3,152
Wynyard	Wynyard	Stockwatering	1947	-	35	6,225
Young	Young	Stockwatering	1948	-	250	8,892

x - Ultimate irrigation development for all projects along Qu'Appelle River Valley 30,000 - (total storage capacity - 95,600 acre feet).

#### ALBERTA

Acadia Valley	Acadia Valley	Dugout	1953	-	1.5	2,252
Acadia Valley #2	Acadia Valley	Dugout	1954	-	1.5	1,000
Aetna Irrigation District	Aetna	Irrigation	1947	8,000	-	82,004
Airdree	Calgary	Multi-purpose Res.	1958	-	200	9,789
Ambrose Flats	Irvine	Irrigation	1951	800	1,000	4,781
Anatole	Hanna	Stockwatering	1953	-	7	2,990
Antelope Park	Nemiscam	Stockwatering Dugout	1957	-	1.5	1,000
Argyle, M.D. of	Staveley	Stockwatering	1949	-	80	10,912
Atlee Gas Well #1	Atlee	Irrigation (pump)	1939	7,000	-	12,423
Atlee Gas Well #2	Atlee	Irrigation (pump)	1939	-	-	14,300
Atlee Buffalo	Atlee	Dugout	1959	-	9	7,200
Badger Lake	Lomond	Stockwatering	1948	-	10	2,990
Bain Community	Foremost	Dugout	1959	-	10.5	6,800
Balzac	Balzac	Irrigation	1956	900	-	8,141
Bare Creek	Comrey	Irrigation & Dam	1950	-	500	11,600
Bare Creek #2	Comrey	Multi-purpose Dam	1956	1,000	1,100	13,029
Bartman Dam	Cessford	Irrigation	1943	1,000	3,000	49,100
Beautyland	Bindloss	Dugout	1959	-	6	1,500
Beauvais Lake	Pincher Creek	Irrigation	1950	2,000	2,400	15,996
Beaver Dam Creek Reservoir	Castor	Stockwatering	1950	-	300	17,996
Bedford Slough	Medicine Hat	Irrigation	Incomplete	3,000	200	35,493
Bell Lake	Pollockville	Irrigation	1949	700	1,500	4,738
Berry Creek	Carolside	Irrigation	1948	10,000	30,000	158,884

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acres Feet	Costs
Bircham	Calgary	Flood Irrigation	1958	1,200	-	8,295
Bluefield Grazing Assoc.	Thelma	Stockwatering	1956	-	30	3,500
Blood Indian Reserve	Cardston	Dugout	1960	-	-	2,079
Blood Indian Reserve #2	Cardston	Dugouts (8)	1961	-	-	3,000
Bow Island	Bow Island	Stockwatering Dam	1958	-	1.5	1,000
Bow Slope Grazing Assoc.	Brooks	Dugouts (3)	1961	-	-	1,358
Bowell	Bowell	Dugout	1954	-	1.5	1,000
Bowmanton	Bowmanton	Stockwatering	1953	-	500	14,860
Brunswick Coulee	Enchant	Irrigation	1949	500	205	4,631
B.T. Grazing Co-op.	Hilda	Stockwatering	1956	-	3	1,000
B.T. Grazing Co-op.	Hilda	Dugout	1961	-	-	1,312
Bull Pound Creek	Hanna	Stockwatering Dam	1939	-	2,000	-
Bullshead Creek	Medicine Hat	Irrigation	1940	800	1,130	8,170
Burke Creek	Claresholm	Stockwatering Dugout	1957	-	6	3,890
Burm's Creek	Burm's	Multi-purpose Res.	1957	550	250	14,683
Cameron	Youngstown	Multi-purpose Dam	1957	662	1,000	3,905
*Canada Land & Irrig. Project	Medicine Hat	Irrigation	1936	45,000	-	80,000
Caranova	Bowell	Multi-purpose Res.	1957	500	250	8,199
Carbon	Carbon	Multi-purpose Res.	1957	300	50	8,958
Champion	Champion	Irrigation	1954	2,500	-	4,984
Chauvin Grazing Co-op.	Chauvin	Dugouts (3)	1961	-	-	1,180
Chipman Creek	Burm's	Flood Irrigation	1957	700	-	3,298
Clear Lake	High River	Stockwatering	1948	-	10,000	35,000
Collins	Sheerness	Stockwatering Res.	1956	-	40	3,495
Commodore	Vulcan	Irrigation	1954	400	-	3,990
Comrey Grazing	Comrey	Dugout	1953	-	1.5	1,000
Conrich	West Calgary	Irrigation	1954	1,600	-	6,240
Consort	Hanna	Stockwatering	1955	-	20	9,651
Coutes Community Project	Coutes	Stockwatering Dam	1959	-	15	7,743
Cowley Community	Cowley	Irrigation	1952	750	-	4,666
Craigmyle	Craigmyle	Multi-purpose Dugout	1958	-	1.5	1,000
Cressday	Medicine Hat	Stockwatering	1954	-	-	13,541
Crowfoot	Gleichen	Multi-purpose Res.	1958	-	110	3,576



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Cutbank Coulee	Cressday	Stockwatering Res.	1956	350	500	2,337
C.Y. Water Users	Taber	Stockwatering	1949	-	310	16,477
Cypress View	Irvine	Multi-purpose Res.	1958	-	300	11,336
D'Arcy	Hanna	Multi-purpose Res.	1957	-	15	2,116
Dead Fish Creek	Cessford	Irrigation	1949	4,000	5,000	47,832
Del Bonita	Twin River	Stockwatering	1955	-	250	9,196
Delia	Morrin	Stockwatering	1955	-	165	3,914
Drowning Ford	Vale	2 Dugouts & Dam	1953	-	100	4,368
Drowning Ford	Medicine Hat	Dugout	1961	-	-	1,000
East Berry Creek	Roselynn	Irrigation	1949	1,500	750	9,677
East Trout Creek	Stavely	Stockwatering Dam	1958	-	8	3,446
*Eastern Irrigation District	Brooks	Irrigation	1937	2,280	22,000	22,490
Eastern Irrigation District	Brooks	Irrigation	Incomplete	-	-	35,793
(Antelope Coulee)	Hanna	Stockwatering	1954	-	17	2,808
Esler	Macklin	Irrigation	1952	4,000	5,000	4,592
Esther Flood Irrigation	Grassy Lake	Irrigation	1949	12,000	1,000	38,568
Eureka Irrigation Project	Bow City	DO & Stockwatering	1961	-	-	1,300
Eyemore Grazing Assoc.						
Fenn	Stettler	Stockwatering Dam	1959	-	35	1,400
Fish Lake	Pincher Creek	Irrigation & Dam	1954	1,000	-	6,895
Franklin Coulee	Retlaw	Stockwatering	1948	-	1,500	20,125
Garden Plains	Sponden	Stockwatering Dugout	1956	-	6	1,596
Graham Creek	Calgary	Stockwatering Dam	1943	-	230	8,529
Granlea Community	Granlea	Stockwatering Dam	1959	-	725	12,853
Grainger	Three Hills	Multi-purpose Res.	1956	30	117	9,482
Greasewood Coulee	Manyberries	Irrigation & Dam	1954	500	650	9,798
Halkirk Com.	Halkirk	Irrigation	Incomplete	303	-	2,637
Hampton	Youngstown	Multi-purpose Res.	1957	2,000	401	8,000
Hanna	Hanna	Stockwatering	1948	-	500	29,498

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Hays	Hays	Dugout	1960	-	-	4,500
Heath Creek	Northfork	Stockwatering Dam	1958	-	12	3,848
Hilda Community Project	Hilda	Multi-purpose Dugout	1957	-	10	5,180
Huber Dam	Castor	Stockwatering Dam	1959	-	112	3,068
Illingsworth	Bow Island	Dugout	1954	-	1.5	1,000
Indian Farm Creek	Pincher Creek	Irrigation & Dam	1953	600	500	4,795
Indus Community Project	Conrich	Irrigation	1955	1,220	-	9,843
Irvine	Irvine	Irrigation & Dam	1950	70	100	4,799
Irvine	Irvine	Multi-purpose Res.	1960	-	15	4,714
Jaydot	Elkwater	Multi-purpose Res.	1956	300	400	8,988
Kathryn	Calgary	Irrigation & Dam	1954	300	-	9,184
Lake Valley	Bowell	Stockwatering Dugout	1957	-	1.5	1,000
*Leavitt Irrigation	Mountain View	Irrigation	1939	7,000	7,050	65,578
Lewis	Vulcan	Irrigation & Dam	1953	350	-	4,345
Lochend Lake	Calgary	Dam & Irrigation	1958	1,600	1,100	7,750
Lomond	Lomond	Dugout	1959	-	3	1,000
Lomond Grazing Assoc.	Lomond	Dugouts (5)	1961	-	-	2,500
Loveland	Hanna	Irrigation	1954	3,000	-	17,655
Loyalist Creek	Hanna	Irrigation	1950	2,000	1,400	14,993
Lundbreck	Pincher Creek	Stockwatering	1953	-	100	4,689
McArthur	Walsh	Dam	1959	-	700	14,565
McAlpine Reservoir	Walsh	Irrigation	1951	600	1,000	15,917
McGregor Dam	Vulcan	Irrigation	1951	1,500	700	9,473
McLaren	Michichi	Multi-purpose Res.	1957	150	660	13,815
Mackay Dam	Walsh	Irrigation	1952	600	300	9,600
*Magrath	Magrath	Irrigation	1939	4,000	-	2,756
Meadow Creek Dam	Claresholm	Irrigation	1952	1,500	-	5,630
Medicine Lodge Stock Assoc.	Medicine Hat	Stockwatering Dam	1961	-	-	1,372
Mekastoe	Fort MacLeod	Dam	1959	-	210	4,594



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Michelle Creek Project	Thelma	Multi-purpose Res.	1959	-	800	14,791
Michichi	Morrin	Stockwatering Dam	1961	-	450	4,629
Milk River	Milk River	Dugout	1960	-	-	4,448
Milk River Co-op. Grazing Assoc.	Milk River	Dugouts (4)	1961	-	-	3,908
Milne Community Project	Conrich	Irrigation	1955	1,300	-	9,644
Mountain View	Mountain View	Storage Dam	1936	-	4,200	3,000
Naismith	Youngstown	Multi-purpose Res.	1956	300	145	9,421
Nemiscam	Etzikom	Dugout	1954	-	1.5	1,000
Nester	Cessford	Multi-purpose Res.	1957	300	1,350	8,670
New Brigden	Hanna	Stockwatering Dam	1958	-	60	3,582
Newell Cattle Grazing Assoc.	Brooks	Dugouts (5)	1961	-	-	2,055
Nobleford Water Users	Nobleford	Dugouts (2)	1953	-	3	11,173
North Fincastle	Taber	Irrigation & Dam	1948	2,000	4,000	17,943
Osburne Water Conservation	Iddesleigh	Dam	1959	-	210	9,495
Oyen	Oyen	Stockwatering Dugout	1957	-	1.5	1,000
Parfles	Chancellor	Irrigation	1954	250	-	4,730
Parr Reservoir	Castor	Multi-purpose Dam	1961	-	-	31,463
Patricia Grazing Co-op.	Patricia	Dugout & SWD	1961	-	-	3,363
Peace Butte Reservoir	Peace Butte	Stockwatering	1955	450	550	8,993
Peigan Indian Reserve	Brocket	Dugouts (6)	1961	-	-	4,395
Pershing Dam	Glenwood	Irrigation	1951	100	200	4,782
Pirmez Creek	Pirmez Creek	Irrigation	1951	6,000	500	20,998
Porcupine Hills	Fort MacLeod	Dugout	1959	-	1.5	4,599
Porcupine Hills Stock Assoc.	Fort MacLeod	Dugout	1960	-	-	1,868
Pothole Coulee	Magrath	Irrigation	1948	Part of St. Mary Project	-	-
Priddis	High River	Stockwatering	1955	-	312	8,802
Provost, Village of	Provost	Multi-purpose Dam	1956	-	3	4,812
Ranchville Community Res.	Ranchville	Irrigation	1957	300	-	4,950
*Raymond	Raymond	Irrigation	1943	3,000	1,600	6,000

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Reid Hill	Vulcan	Irrigation	1952	1,000	700	8,866
Remount	Bindloss	Dugout	1960	-	-	3,000
Rock Creek Stock Assoc.	Sandbreck	Stockwatering Dugout	Incomplete	-	-	1,819
Rock Creek Stock Assoc.	Lundbreck	DO & Stockwatering	1961	-	-	2,380
Rock Lake Project	Brooks	Irrigation	1957	11,000	-	133,984
*Rolling Hills	Rolling Hills	Irrigation	1938	25,000	-	46,839
Rose Glen Water Users	Schuler	Multi-purpose Dam	1957	200	150	6,884
Ross Creek	Irvine	Irrigation	1950	3,000	5,000	47,998
Ross Lake Com. Pasture Assoc.	Cardston	Dugouts (4)	1961	-	-	2,160
Ross Lake Community	Raymond	Stockwatering	1950	-	300	7,987
Rough Meadow Reservoir	Coronation	Irrigation	1951	200	-	2,471
Ruks	Pincher Creek	Irrigation & Dam	1954	900	250	6,484
Sarcee Indian Band Reserve						
#145	Calgary	Dugouts (2)	1961	-	-	1,575
Schuler Waters Users	Schuler	Multi-purpose Res.	1957	-	5	5,443
Serviceberry Creek	near Drumheller	Irrigation	1949	1,200	500	17,518
Seven Persons	Seven Persons	Stockwatering Dam	1943	-	800	12,103
Severn Creek	Rosebud	Irrigation & Dam	1950	1,000	1,000	24,990
Sheerness Grazing (Blois)	Roselynn	Stockwatering	1953	-	12	3,797
Sheerness #2	Roselynn	Stockwatering	1954	-	50	2,190
Snake Creek	Calgary	Irrigation & Dam	1950	500	300	15,976
Spondin	Hanna	Dugout	1955	-	1.5	1,000
Spruce Coulee	Elkwater	Stockwatering Dam	1959	-	1,000	12,496
Spruce Co-op.	Parkland	Stockwatering Dugout	1960	-	-	3,529
Starland, M.D. of	Morrin	Stockwatering	1956	-	45	3,196
Stehr Coulee	Walsh	Multi-purpose Res.	1956	-	26	4,570
Sterling Pasture Co-op. Ltd.	Sterling	Dugout	1961	-	-	1,000
Sounding Creek	Cereal	Irrigation	1949	8,000	5,600	51,988
South MacLeod	MacLeod	Irrigation	1948	6,000	-	82,614
Squaw Coulee	High River	Irrigation	1949	2,000	455	17,999
Sundial	Champion	Dugout	1959	-	6	3,102
Sundial	Champion	Dugout	1961	-	-	3,650
Swalwell	Swalwell	Multi-purpose Res.	1957	280	300	9,463



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Three Hills	Three Hills	Stockwatering	1948	-	120	19,652
Twin Lakes	Chancellor	Irrigation	1954	500	-	12,498
Twin River Grazing	Twin River	Stockwatering	1953	-	125	4,486
Twin River Grazing Assoc.	Milk River	Dugouts (8)	1961	-	-	4,726
Two Lakes	Elkwater	Multi-purpose Res.	1958	1,500	1,900	14,378
Vulcan Dam	Vulcan	Irrigation	1951	400	150	3,997
Vauxhall	Vauxhall	Stockwatering	1948	-	30	5,883
Waddington	Vale	Multi-purpose Res.	1957	-	12	2,904
Walsh Flats	Walsh	Irrigation	1953	2,100	25,000	4,700
Watts Flats	Watts	Flood Irrigation	1958	2,000	-	6,147
(Bull Pound-Lone Butte)	Claresholm	Dugout	1960	-	-	2,263
West Trout Creek	Rockyford	Irrigation	1952	-	-	4,744
Wheatacre #2	Rockyford	Irrigation	1950	1,600	1,500	12,976
Wheatacre Dam	Cressday	Irrigation	1936	3,600	4,500	24,370
Wild Horse Storage	Hussar	Irrigation	1950	1,000	500	9,993
Wintering Hills	Medicine Hat	Multi-purpose Res.	1957	420	500	14,403
Wisdom Waters Users	Cardston	Irrigation	1955	400	-	3,593
Woolford Community Project	Milk River	Dugout	1959	-	6	8,291
Writing on Stone						
Yeast Reservoir	Thelma	Irrigation	1953	400	800	6,592

\* - P.F.R.A. gave assistance to a project already in existence to improve storage capacities, canals and distribution systems.

# APPENDIX V

## CUMULATIVE STATEMENT

Development and Operation of Community Pastures under the  
Prairie Farm Rehabilitation Act  
1938 to March 31, 1962

Fiscal Year	No. of Pasture Units in Operation	Area of Land in Pastures (acres)	Total Cost of Construction of Pastures \$	Livestock Units Carried on Pastures	X Acres per Unit of Live-stock	Cost of Operation Revenue \$	Operating Costs \$	Net Operating cost per Unit of Livestock \$	Average Charge per Unit Livestock to Farmers \$
1938-39	14	189,800	165,995.03	3,231	58.7	6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1	21,632.71	20,945.84	1.82	1.88
1940-41	35	884,500	1,004,305.91	23,245	38.1	43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2	65,434.89	50,607.22	1.52	1.97
1942-43	45	1,261,100	1,129,487.54	51,127	24.7	98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3	111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,699,012.21	59,997	22.3	151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1	167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6	198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4	203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1	204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5	211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1	221,129.45	217,867.15	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4	335,327.16	237,742.13	3.08	4.34
1952-53	59	1,652,020	3,754,098.41	94,137	17.5	438,513.75	373,737.36	3.97	4.66
1953-54	60	1,678,736	3,963,572.83	109,583	15.3	507,179.14	490,807.89	4.48	4.55
1954-55	60	1,696,900	4,273,916.79	106,322	15.9	496,805.78	466,153.69	4.38	4.66
1955-56	60	1,728,700	4,509,668.59	108,499	15.8	499,045.13	501,540.73	4.67	4.60
1956-57	61	1,759,570	4,832,863.47	117,441	14.9	548,601.01	508,002.83	4.33	4.67
1957-58	61	1,796,275	5,119,317.01	119,398	15.0	552,938.40	607,129.23	5.08	4.63
1958-59	62	1,815,265	5,509,958.43	117,032	15.5	542,606.90	686,448.88	5.87	4.64
1959-60	64	1,818,464	5,800,342.43	124,812	14.6	705,785.32	742,915.21	5.95	5.65
1960-61	65	1,896,173	6,254,224.42	122,813	15.4	656,708.97	879,811.85	7.15	5.35
1961-62	68	2,088,704	6,845,655.79	146,672	14.2	860,808.25	1,128,255.75	7.69	5.87
						<u>7,847,861.16</u>	<u>8,053,200.82</u>		

x — A livestock unit indicates one head of cattle, one horse, or five sheep.

A pasture unit may include one or more pastures, but it is operated under one management.



## APPENDIX VI

## P.F.R.A. COMMUNITY PASTURES IN OPERATION DURING THE FISCAL YEAR ENDED MARCH 31, 1962

Community Pasture & Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1961	Accumulated Cost of Construction March 31, 1962	1961-1962 Stock Pastured		
				Cattle	Horses	Sheep
<u>Pasture Units - Saskatchewan</u>						
Coalfields #4, North Portal	32,860	168,350.39	172,736.76	3,818	57	1,385
Estevan Cambria #5-6, Macoun	6,720	20,196.57	21,191.07	480	5	
Masefield #17, Orkney	36,320	116,697.63	120,697.63	1,720	-	
Lone Tree #18, Bracken	33,600	100,350.71	107,216.97	1,446	-	
Battle Creek #20, Divide	69,920	169,123.89	169,949.49	2,763	-	
Nashlyn, #21, Consul	61,520	97,211.43	97,211.43	2,588	3	39
Govenlock #22, Govenlock	68,800	118,191.72	118,191.72	2,184	-	
Lomond #37, #1 Pasture, Goodwater	23,360	91,750.96	92,010.85	2,959	39	
Lomond #37, Pasture #3, Maxim	18,400	84,741.93	93,533.58	1,726	16	
Laurier #38, Lomond #37 - #2, Radville	37,175	113,128.19	117,361.14	3,160	47	
The Gap #39, Ceylon	13,920	90,718.80	91,335.44	1,308	19	
Val Marie #47, Pasture #1, Val Marie	110,000	280,003.90	280,550.38	5,462	-	
Val Marie Beaver Valley #2, Admiral	57,680	57,203.67	60,686.85	3,169	19	
Reno #51, Pasture #1, Robsart	17,120	63,533.54	64,633.54	1,051	4	
Reno #51, Pasture #2, Consul	11,360	29,877.83	29,877.83	690	-	
Tecumseh #65, Forget	18,880	82,558.52	95,510.49	2,159	17	
Brokenshell #68, Pasture #1, Yellow Grass	22,720	107,794.02	112,282.91	2,072	50	
Brokenshell #68, Pasture #2, Weyburn	8,160	16,651.04	16,730.80	442	1	
Excel #71, Ormiston	20,500	79,670.48	80,993.88	1,836	-	
Key West #70, Kayville	10,240	38,428.53	38,641.58	977	3	
Auvergne Wise Creek #76-77, Cadillac	42,880	149,257.05	149,511.56	3,332	-	
Wellington #97, Tyvan	25,360	118,817.95	125,554.55	3,175	54	
Caledonia-Elmsthorpe #99-100, Milestone	26,400	120,757.03	121,804.41	2,086	37	
Shamrock #134, Shamrock	26,080	87,147.26	87,147.26	1,637	-	
Swift Current-Webb 137-8, Swift Current	18,720	83,756.75	98,849.80	1,599	-	
Gull Lake #139, Tompkins	10,720	34,490.60	34,992.31	674	-	
Big Stick #141, Maple Creek	22,260	46,863.40	48,320.53	1,940	-	
Bitter Lake #142, Maple Creek	43,710	127,956.07	130,213.93	2,482	-	

Community Pasture & Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1961	Accumulated Cost of Construction March 31, 1962	1961-1962 Stock Pastured		
				Cattle	Horses	Sheep
Pasture Units - Saskatchewan (cont'd)						
Spy Hill #152, Welby (operated in conjunction with Ellice, Man.)	19,570	58,871.71	58,871.71	2,496	9	
Elbow #223-4, Elbow	30,080	84,600.53	84,839.03	2,146	52	
Beaver Hills #245-6, Homefield P.O.	44,160	143,617.54	157,100.31	4,456	193	
Willner #253, Davidson	13,280	84,903.92	86,368.38	1,726	7	
Coteau #255, Birsay	27,520	64,261.84	67,795.84	1,533	24	
Monet #257, Elrose	46,840	111,984.14	124,133.00	3,100	25	
Fairview #258, Chipperfield	17,000	123,963.45	126,181.09	1,395	-	
Newcombe #260, Glidden	52,960	181,205.44	195,010.30	3,315	23	
Mantario #262, Empress, Alta.	24,960	81,666.07	83,767.24	1,919	-	
Cote #271, Togo	9,920	78,962.31	79,890.71	1,247	17	
Mt. Hope Prairie Rose #279-309, Semans	32,180	110,173.39	112,957.41	2,570	-	
Wreford #280, Hatfield	13,870	83,615.95	83,615.95	1,200	-	
McCraney #282, Davidson	10,720	69,895.27	70,021.52	1,509	-	
Rudy Rosedale #284-3, Broderick	19,200	90,880.19	90,880.19	1,667	49	
Hillsburgh #289, Brock	13,600	56,880.27	57,625.39	948	-	
Eagle Lake #289-319, Netherhill	23,249	95,768.42	105,168.41	1,155	-	
Kindersley-Elma, #290-1, Smiley	21,400	121,382.25	123,324.68	1,113	6	
Usborne #310, Venn	12,680	58,956.64	60,703.25	1,257	-	575
Dundurn #314, Dundurn	44,840	114,757.38	118,528.25	2,304	-	
Montrose #315, Donavon	21,600	78,341.95	85,657.27	1,080	-	
Oakdale #320, Beaufield	20,800	75,411.20	98,607.41	1,721	5	
Antelope Park #322, Hoosier	34,320	112,818.28	112,978.89	2,729	35	
Wolverine #340, Plunkett	17,280	76,857.29	83,276.31	2,026	-	
Mariposa #350, Kerrobert	26,880	103,040.78	103,096.08	1,936	-	
Progress #351, Kerrobert	19,680	67,877.84	74,551.62	1,559	-	
Hearts Hill #352, Compeer, Alta.	15,520	63,740.01	64,988.96	1,595	-	
Park #375, Langham	7,040	22,633.89	22,633.89	383	-	



Construction Pasture & Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1961	Accumulated Cost of Construction March 31, 1962	1961-1962 Stock Pastured		
				Cattle	Horses	Sheep
<u>Pasture Units — Saskatchewan (cont'd)</u>						
Battle River-Cutknife #438-9	31,680	99,026.56	99,932.39	1,566	15	
Royal #465, Marcelin	65,120	233,949.90	237,816.18	4,748	19	
Paynton #470, Paynton	24,480	88,978.58	90,641.54	1,802	22	
Totals for Saskatchewan	1,657,814	5,534,252.85	5,738,701.89	117,136	872	1,999
Special Project — Bitter Lake Irrigation included in Bitter Lake Pasture.						
<u>Pasture Units — Manitoba</u>						
Ellice Pasture, Welby, Sask. (operated in conjunction with Spy Hill #152)	20,320	28,746.37	28,998.21	—	—	1,600
Archie Pasture, Welwyn, Sask.	39,740	97,852.50	99,482.17	2,472	16	
Portage Pasture, Poplar Point	14,640	46,399.28	48,923.97	2,802	59	
Woodlands Pasture, Poplar Point	20,960	70,992.27	75,389.92	3,282	73	
Lakeview, Langruth	29,280	82,148.14	84,820.82	2,698	24	
Westbourne, Gladstone	12,700	51,419.83	57,664.63	1,845	8	
Langford, Neepawa	20,000	76,670.69	77,559.36	2,211	29	
San Clara	8,320	33,679.63	34,608.03	—	—	
McCreary	71,820	232,062.86	244,935.46	1,616	17	
Wallace, Elkhorn, Man.	3,280	(Operated by the R.M. of Wallace)				
Dauphin — Ethelbert, Ukraina	23,240	—	120,014.99	1,222	18	
Turtle Mountain, Boissevain	23,870	—	143,750.19	1,441	7	
Total for Manitoba	288,170	719,971.57	1,016,147.75	19,589	251	1,600
<u>Pasture Units — Alberta</u>						
Suffield	142,720	—	90,806.15	8,104	—	
Total for Alberta	142,720	—	90,806.15	8,104	—	
GRAND TOTALS	2,088,704	6,254,224.42	6,845,655.79	144,829	1,123	3,599

APPENDIX VII  
MAJOR PROJECTS – IRRIGATION, RECLAMATION AND WATER STORAGE  
(Projects by Special Votes of Parliament, Administered by P.F.R.A.)  
to March 31, 1962

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
MANITOBA						
Assiniboine River Diking & Cut Off	Brandon	River Control	Incomplete	—	—	1,186,158.00
North-West Escarpment Reclamation Proj. — Riding Mt. Area	Dauphin	Watershed Control	Incomplete	—	—	1,102,164.00
Fairford River Project	Lake Manitoba	Flood Control	1960	—	—	286,891.00
Saskatchewan River Reclamation — Pasquia Area	The Pas	Reclamation	Incomplete	135,000	—	2,256,388.00
ALBERTA						
Bow River (a) Purchase of Canada Land & Irrigation Company (b) Development & Construction	Medicine Hat	Irrigation	Incomplete	235,000	408,862	54,398.00
St. Mary	Lethbridge	Irrigation	Incomplete	510,000	320,000	2,353,182.00
Belly River Diversion	Lethbridge	Irrigation	1950	—	—	21,195,793.00
						16,243,519.00
						53,901.00
BRITISH COLUMBIA						
Cawston Benches	Keremeos	Irrigation (pump)	1951	629	2,000	185,491.00
Chase & Johnston — Western Canada Ranching	Kamloops	Irrigation	1951	755	—	98,243.00
Western Canada Ranching #2	Kamloops	Irrigation (pump)	1950	54	—	58,069.00
Lillooet — Pemberton	Pemberton	River Control	1953	—	—	1,056,539.00
South Thompson — Niskonlith Gravity Project	Kamloops	Irrigation	Incomplete	1,030	1,200	12,282.00
Westbank Project	Kelowna	Irrigation	1950	1,200	2,500	537,450.00
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	—	32,229.00
Penticton West Bench	Penticton	Irrigation (pump)	1953	800	—	66,362.00
B.C. Fruitlands	Kamloops	Irrigation	Incomplete	2,000	—	200,000.00

(Above includes ONLY Construction Costs)



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
SASKATCHEWAN						
South Saskatchewan River Project	Outlook	Multi-purpose	Incomplete	500,000 (Including 24,000 in Qu'Appelle extension)	—	32,032,378.00
Buffalo Pound Project	Qu'Appelle Valley	Urban Water Supply	1960	—	42,000	2,187,359.00
— Eyebrow Lake Diversion	Eyebrow	Water Supply	1960	—	—	98,376.00
(Above includes ONLY Construction Costs)						

APPENDIX VIII  
PFRA EXPENDITURES BY ACTIVITIES  
April 1, 1935 to March 31, 1962

ADMINISTRATION

Ottawa and Regina Administration	\$ 2,692,427
Engineering Services — Surveys, Design, Soil Mechanics, Drainage Studies, Legal Surveys, Supervision of Construction	20,665,335

LAND UTILIZATION

Cultural work — Soil Drifting, etc. (Exp. Farm Service)	4,966,394
Community Pastures — Construction, Operation and Maintenance Movement of Settlers	21,553,746 227,841

WATER DEVELOPMENT

Small Farm Projects	23,354,077
Community, Large Water Storage and Irrigation Projects Supervision	19,042,118 3,518,603
Equipment — Purchase and Repairs, Service Depot	7,791,874

MAJOR PROJECTS: IRRIGATION, RECLAMATION AND CONSERVATION

St. Mary Irrigation Project	23,748,648
Bow River Irrigation Project	30,577,445
South Saskatchewan River Project	40,332,576
Assiniboine River Dyking	1,349,288
B.C. Reclamation and Development, incl. Lillooet Project	3,310,182
Land Protection and Reclamation, Manitoba and Eastern Canada	3,924,221
Miscellaneous Projects — Construction	4,144,500
	\$211,199,275

REVENUE:

Community Pasture Operations	\$ 8,435,726
Irrigation Project Operation and General Revenue	4,134,074
	\$12,569,800





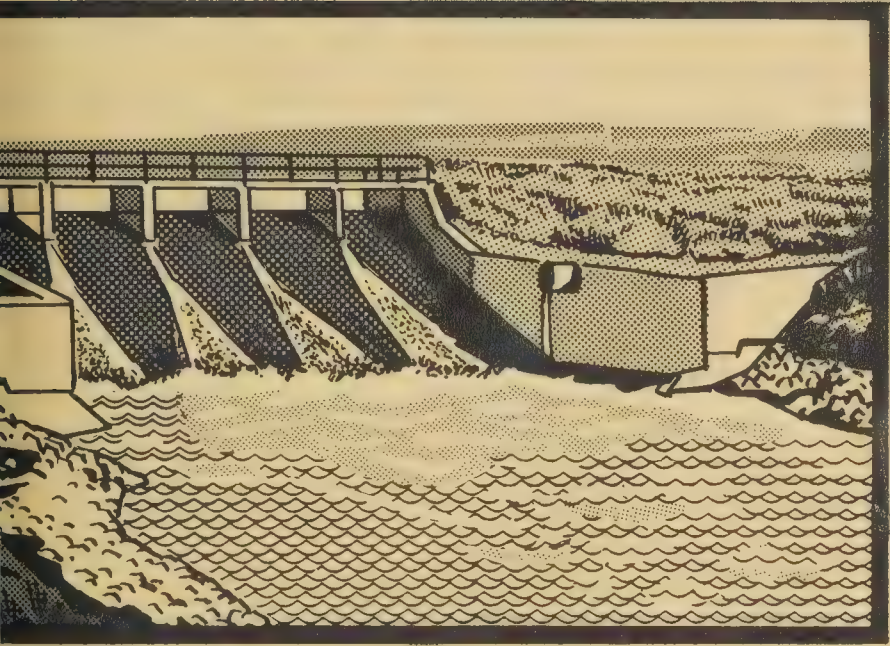
ROGER DUHAMEL, F.R.S.C.  
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY  
OTTAWA



W. Doc  
an  
g  
Canada, Agriculture, Department of,  
III Prairie Farm Rehabilitation Branch

CAI DA20  
A56

JUL 21 1962  
UNIVERSITY OF



# Annual Report

Prairie farm rehabilitation  
and related activities

1962  
1963





**ANNUAL REPORT**  
**PRAIRIE FARM REHABILITATION**  
**and RELATED ACTIVITIES**  
**1962-1963**





# CONTENTS

	Page
INTRODUCTION .....	
ORGANIZATION .....	
ADMINISTRATION DIVISION .....	1
Personnel .....	1
Finance .....	1
Office Services .....	1
Purchasing .....	1
Information .....	1
Land .....	2
WATER DEVELOPMENT SERVICE .....	4
Farm and Community Projects .....	4
Large Water-Development Projects .....	6
Crystal City Dam .....	6
Deloraine Dam .....	6
Elie Dam (Lasalle River Project) .....	7
Stephenfield Dam .....	7
Craig Community Storage Project .....	7
Gainsborough Community Project .....	9
Weyburn Water-storage Project .....	9
Redvers Dam (Lightning Creek Project) .....	9
West Poplar Project .....	10
Kettlehut Lake Dam .....	10
Summerville Dam .....	10
Avonlea Creek Project .....	11
Theodore Dam .....	11
Carolside Dam (Berry Creek Project) .....	11
Technical Assistance .....	11
Irrigation Projects .....	11
Southwest Saskatchewan Projects .....	11
Bow River Project .....	12
Project Maintenance and Construction .....	16
Predevelopment Farm .....	17
LAND USE SERVICE .....	20
Pasture Operations .....	20
Pasture Services .....	21
Haying and Regrassing .....	21
Fires and Fire Protection .....	22
Grasshopper Control .....	22
Breeding Service .....	23
Livestock Diseases .....	23

# CONTENTS (continued)

	Page
<b>LAND USE SERVICE (continued)</b>	
Livestock Insurance .....	24
Pasture Construction .....	24
Pasture Improvement .....	25
<b>ENGINEERING SERVICES BRANCH .....</b>	<b>27</b>
Design Division .....	27
Drafting Section .....	27
Air Photo Analysis and Engineering Geology Division .....	28
Soil Mechanics and Materials Division .....	29
Hydrology Division .....	30
Surveys .....	31
Major Construction Projects .....	31
St. Mary Irrigation Project .....	31
South Saskatchewan River Project .....	34
Regional Engineering Projects .....	36
Buffalo Pound Lake Water-supply Project .....	37
Assiniboine River Project .....	38
Northwest Escarpment and Interlake Projects .....	39
<b>APPENDICES .....</b>	<b>48</b>
Appendix I	
Water Development Program – Progress by Years in the Construction of Individual, Neighbor and Community Projects .....	41
Appendix II	
Water Development Program – Number of Individual, Neighbor, Community and Large Water Development Projects completed and amount of financial assistance paid from April 1, 1962 to March 31, 1963 .....	42
Appendix III	
Water Development Program – Number of Individual, Neighbor, Community and Large Water Development Projects completed and amount of financial assistance paid from April 1, 1935 to March 31, 1963 .....	43
Appendix IV	
Community Water Storage and Irrigation Projects to March 31, 1963 .....	44
Appendix V	
Cumulative Statement – Development and Operation of Community Pastures under the Prairie Farm Rehabilitation Act 1938 to March 31, 1963 .....	64



## CONTENTS (continued)

	Page
APPENDICES (continued)	
Appendix VI	
P.F.R.A. Community Pastures in Operation During the Fiscal Year Ended March 31, 1963 .....	65
Appendix VII	
Major Projects — Irrigation, Reclamation and Water Storage to March 31, 1963 .....	68
Appendix VIII	
PFRA Expenditures by Activities April 1, 1935 to March 31, 1963 .....	70

## P L A N S

	Plate Number
Small Water Projects .....	I
Community Water Development .....	II
Bow River Irrigation Project .....	III
Community Pastures .....	IV
Major Irrigation and Reclamation Projects .....	V
St. Mary River Project .....	VI





## INTRODUCTION

The Prairie Farm Rehabilitation Act was passed by the Parliament of Canada in 1935 to provide for the rehabilitation of drought and soil-drifting areas of Manitoba, Saskatchewan and Alberta. In 1937 the Act was amended to include land utilization and resettlement, and by further amendment in 1939 it was extended to remain in force indefinitely.

As originally conceived, assistance under the Act concerned mainly activities in conservation and reclamation of land and water resources throughout the southern plains area of the Prairie Provinces. In more recent years, however, P.F.R.A. has also been made responsible for the development of large-scale irrigation and reclamation projects in Western Canada. In 1961, the boundaries of P.F.R.A. were extended to provide assistance in soil and water conservation to all agricultural areas within the Prairie Provinces.

In the latter part of 1962, P.F.R.A. was assigned administration and technical responsibilities for the implementation of the Agricultural Rehabilitation and Development Act in the four western provinces.

The following report presents a review of activities carried out by the Prairie Farm Rehabilitation Administration for the year ended March 31, 1963.





## ORGANIZATION

The Prairie Farm Rehabilitation Act is administered by a Director with headquarters in Regina, who is responsible to the Deputy Minister of Agriculture in Ottawa. Other offices, ranging from regional headquarters to those for individual community pastures, are found at 104 locations in the Prairie Provinces.

In a major reorganization carried out in 1962, the former Agricultural Services Branch was replaced by two new services dealing with land use and water development. In addition, a Program Planning Division was established. These three units, together with the Administration Division and the Engineering Services Branch, now constitute the five main divisions of responsibility within the organization. To assist the Director in coordinating these programs as they apply under both P.F.R.A. and ARDA, a new position of Deputy Director of P.F.R.A. was also established.

The Administration Division consists of units providing financial, personnel, purchasing and office services, as well as an information service and a unit for the acquisition of land. A legal services unit attached to the Director's office is also closely associated with the activities of this Division.

The newly established Program Planning Division is responsible for planning and coordinating both P.F.R.A. and ARDA projects.

The Water Development Service is responsible for the investigation and construction of farm and community water-storage and irrigation projects, for operation of the prairie tree nurseries at Indian Head and Sutherland, transferred from the Research Branch to P.F.R.A. on April 1, 1963; and for irrigation works operated by P.F.R.A. in southwestern Saskatchewan and the Bow River development in Alberta. The operation of the Construction, Equipment and Supply Section is also the responsibility of this service.

The Land Use Service, for which the Deputy Director is directly responsible, is concerned mainly with the development and operation of the community pasture program.

The Engineering Services Branch is responsible for design, soil mechanics investigations, hydraulic, hydrology and air photo analysis and engineering geology studies, as well as all legal and engineering surveys required in the planning of P.F.R.A. projects. Field engineering services are carried out by the Branch through three regional offices at Regina, Calgary and Winnipeg.





## ADMINISTRATION DIVISION

The Administration Division is responsible for the administrative management of P.F.R.A. in accordance with the acts, regulations and policies under which the organization operates. The Division is composed of units responsible for personnel, finance, office services, purchasing, information services and land acquisition.

### Personnel

The personnel unit provides a full range of staff management services, including processing appointments, maintaining establishment control and documenting promotions, leaves and employee benefits. P.F.R.A. employs about 1,200 full-time staff and, at the peak of the busy summer season, up to 600 seasonal and casual employees.

### Finance

The finance unit prepares financial estimates, controls the budget, pays accounts, receives revenue, processes paylists, travel claims and construction contracts, and gives direction to field offices in accounting procedures and methods. In 1962-63, the budget exceeded \$32,600,000 and estimates of about \$32,000,000 were submitted for the 1963-64 fiscal year. Revenue, chiefly from community pasture operations and irrigation projects, totaled \$1,497,321 in 1962-63. A new undertaking during the year called for the establishment of financial procedures for, and the provision of accounting services to, the ARDA program in Western Canada.

### Office Services

The office services unit provides headquarters' offices with central registry, reception, and mail and messenger services. For P.F.R.A. as a whole, it is responsible for the provision of office equipment and supplies, inventory services, administration of staff housing, and office accommodation. The unit also distributes plans and specifications for engineering contracts tendered by P.F.R.A.

### Purchasing

The purchasing unit processed 126 formal tenders valued at \$884,000 during 1962-63. Items purchased included agricultural tractors and implements, industrial machinery, earth-moving equipment, construction materials, and motor vehicles of all kinds. This office also investigates and reports accidents involving P.F.R.A. vehicles and motorized equipment.

### Information

The information unit provides both written and photographic material for interdepartmental and public use.

The unit distributes news and feature material over a wide area, using newspaper, magazine, radio and television outlets; prepares reports, brochures,

articles and publications for direct distribution to the public; and also contacts the public through displays at fairs and exhibitions.

During the fiscal year, over 100 press releases were prepared and distributed to the news media. Ten television films and scripts were produced and received wide coverage. Three radio tapes were sent to radio stations in the Prairie Provinces. In addition, 28 articles, many with pictures, were prepared for magazines and farm weeklies and two displays were constructed for use at Class A and B fairs in Manitoba, Saskatchewan and Alberta.

The photo section provides a full range of basic photographic services to all segments of P.F.R.A. and maintains complete files and cross references on all photographs. During the year, 4,100 photographs taken by the section were filed. In filling 1,205 requests for various services, the section produced close to 35,000 prints. Black-and-white movie footage shot and edited amounted to 9,100 feet.

Library services were extended to all P.F.R.A. offices, including eight field libraries affiliated with the main P.F.R.A. library in Regina. During 1962, the Regina library processed a total of 1,006 accessions, 910 of which were purchased, and circulated 157 periodicals to headquarters and field offices. About 60,000 brochures and pamphlets were sent out by the Regina office. In addition, about 40,000 more were distributed from district and regional offices, on the Class A and B fair circuits, and from the pavilion at the South Saskatchewan River damsite.

#### Land

The land unit is responsible for the appraisal of land required to be purchased or leased for P.F.R.A. undertakings. It also carries out negotiations for purchase or lease, and is responsible for the administrative control and management of lands acquired. Officers of this section work closely with the P.F.R.A. solicitor and his staff, and with the operational services of P.F.R.A. who have land requirements. Frequent contact is also maintained with provincial authorities in the Prairie Provinces, and with other public and private agencies.

As of March 31, 1963, the P.F.R.A. land inventory was as follows:

	<u>Acquired 1962-63</u>	<u>Total Administered</u>
<u>Water Conservation &amp; Reclamation Projects</u>		
Saskatchewan	372	29,663
Manitoba	63	2,244
<u>Community Pastures</u>		
Saskatchewan	816	1,615,243
Manitoba		305,564
Alberta		142,120



	<u>Acquired 1962-63</u>	<u>Total Administered</u>
<u>Major Irrigation Projects</u>		
St. Mary		13,606
Bow River		108,842
South Saskatchewan River	2,991	65,049
<u>Minor Irrigation Projects</u>		
Swift Current	45	15,205
Maple Creek		11,412
Val Marie		16,450
	<hr/>	<hr/>
TOTAL	4,287	2,325,398
	<hr/>	<hr/>

## WATER DEVELOPMENT SERVICE

The construction of individual farm, community and large water-storage and irrigation projects has continued to be one of the basic aims of P.F.R.A. since the Act was passed in 1935. Engineering and financial assistance is provided by the federal government for the promotion of this program in areas where special needs exist.

Due to below-normal runoff in all but a few scattered areas of the prairies, a heavy program of water development was carried out during 1962-63.

### Farm and Community Projects

Water development at the individual farmer and neighbor levels accounts for most of the projects built under this program. These works fall into three main categories: dugouts, stock watering dams, and small irrigation projects. Under the terms of the legislation, the federal government pays about 50 percent of the cost of construction, and provides all agricultural and engineering services through P.F.R.A.



Melting snow arrested by farm shelterbelts during the winter provides the necessary water to fill many thousands of prairie dugouts each spring.

Ref. No. 22809

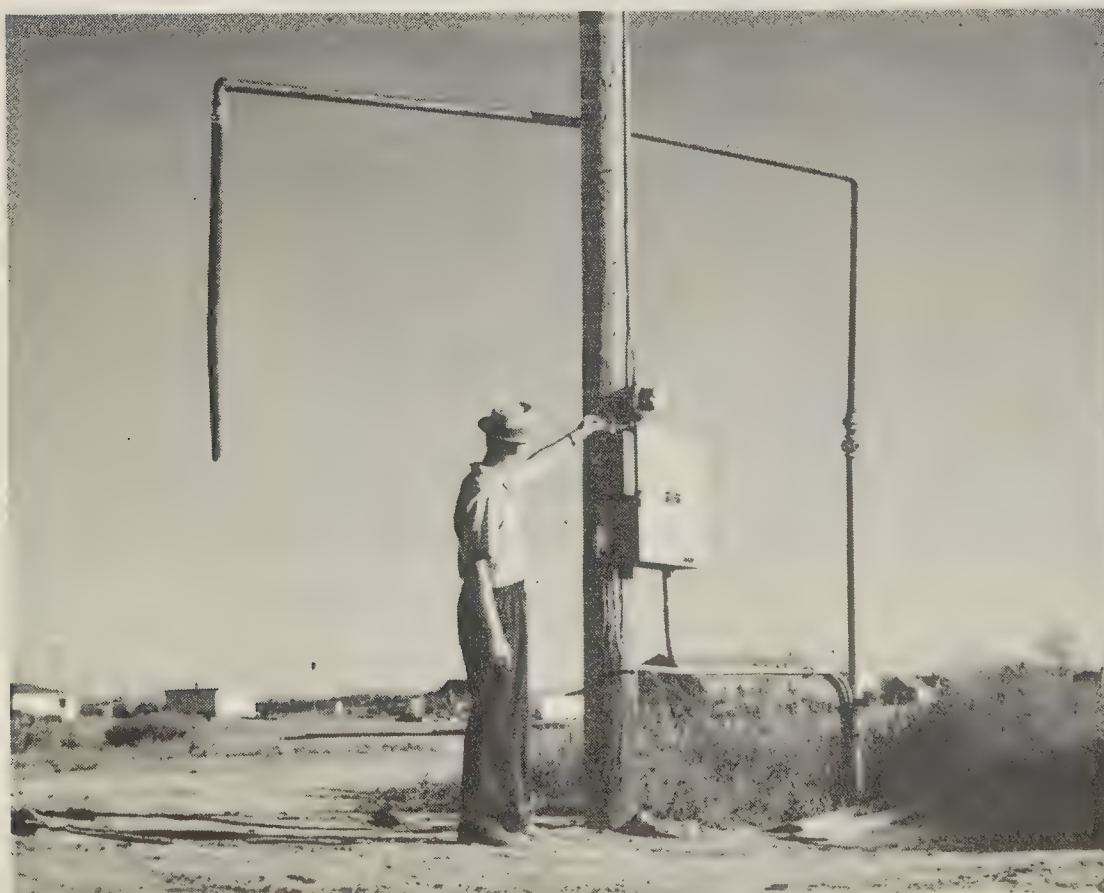
On projects to serve entire communities, each request for assistance is evaluated on the basis of the agricultural benefits that the project will provide. Due to the size of the projects falling into this category, most of the cost is usually borne by P.F.R.A.





Abundant fodder crops are produced when subsoil moisture is augmented by holding spring runoff water on the fields.

Ref. No. 22817



Coin-operated community well constructed at Strongfield, Sask.

Ref. No. 23184

During the fiscal year, a total of 7,422 individual and neighbor projects were constructed in the Prairie Provinces. This figure includes 6,551 dugouts, 559 stock watering dams and 312 irrigation projects. By provinces, 4,446 projects were built in Saskatchewan, 1,914 in Alberta and 1,062 in Manitoba. The total number of projects built under this program since 1935 now stands at 86,072. Construction was also started on an additional 44 community projects during 1962.

Two emergency water-development programs begun during the extreme dry spell in 1961 were continued. One of these entailed pumping water into dugouts from supplies up to a mile away using 6-inch aluminum pipe and gas-powdered pumping units. Three hundred and ninety dugouts were replenished by this method during the year. The other emergency program continued is for the provision of municipal wells. Under this plan, costs are divided between the federal government and the provincial and municipal governments involved. This program has been well received and the development of 51 such wells was approved during 1962.

### Large Water-development Projects

Large water-development projects are undertaken by P.F.R.A. in areas where special requirements exist. These projects are constructed under agreements between Canada and the provincial or local governments concerned, whereby P.F.R.A. builds the projects and then turns them over to other government bodies for operation. Following is a brief description of the projects on which construction was either begun or completed during 1962-63.

#### Crystal City Dam

This dam is in the village of Crystal City, Man., on a tributary of the Pembina River. The total length of the dam is just over 300 feet, and it is capable of impounding 120 acre-feet of water. It is a concrete-pier and stop-log structure with earth fills protected by riprap. It was completed late in 1962 and serves the dual purpose of providing water for livestock and fire protection for the community.

#### Deloraine Dam

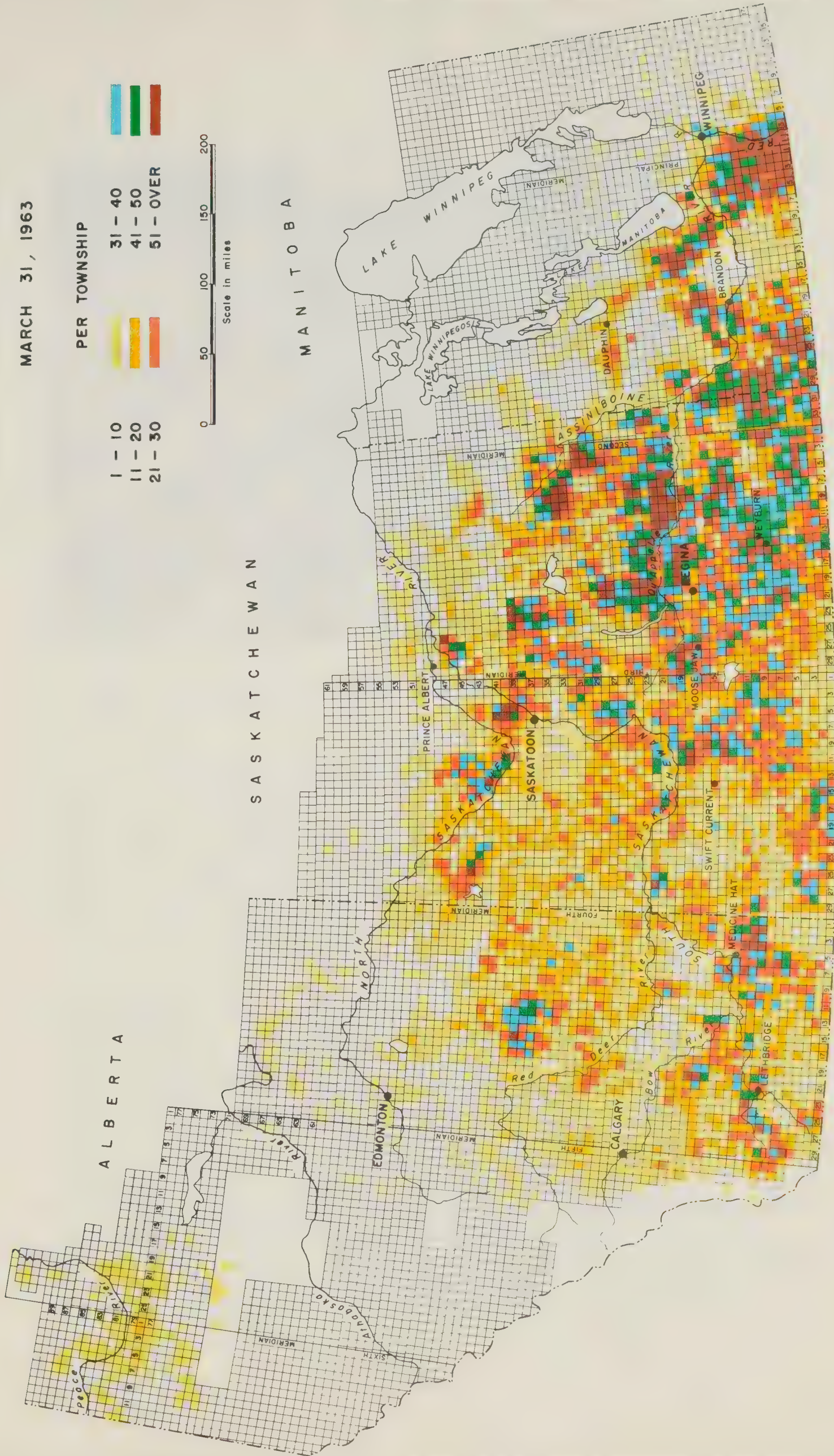
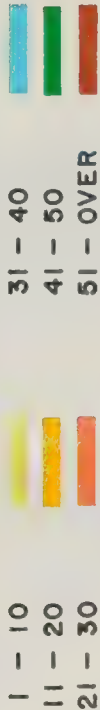
Work on this project was begun in 1961 and completed in 1962. The Deloraine Dam is an earth-fill structure 1,000 feet long and 50 feet high, which impounds a reservoir having a capacity of 1,400 acre-feet. The dam is on Turtlehead Creek, 5 miles southeast of Deloraine, Man. The structure not only serves agricultural purposes but also provides a dependable supply of water for the town.



# SMALL WATER PROJECTS

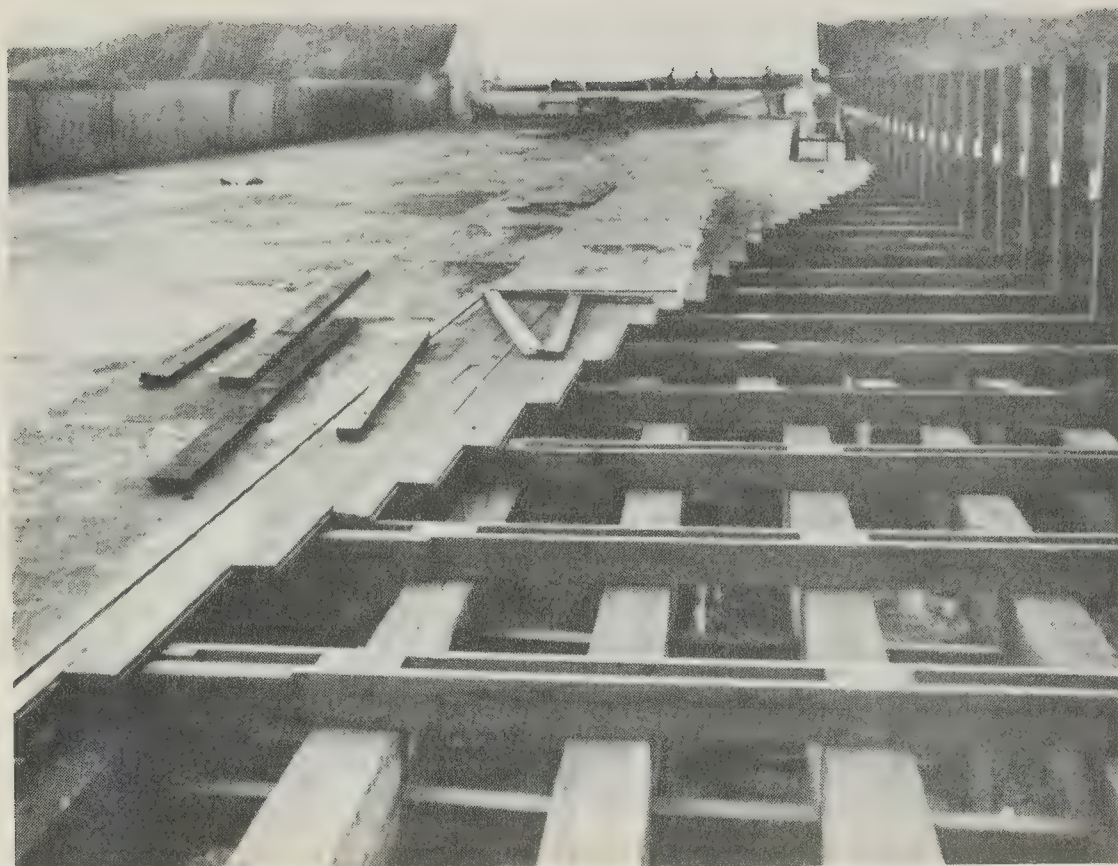
MARCH 31, 1963

PER TOWNSHIP









Timber-chute spillway under construction, Deloraine Dam, Man.

Ref. No. 52155-8

#### Elie Dam (LaSalle River Project)

The Elie Dam is a sloping-slab, stop-log structure built during 1962. It is the farthest upstream of eight dams along a 70-mile stretch of the LaSalle River. The ponds created by these dams provide water for agricultural and domestic purposes in an area where the stream normally dries up during the summer.

#### Stephenfield Dam

The Stephenfield Dam, when completed, will hold 3,600 acre-feet of water and cover an area of about 400 acres. It is in the Valley of the Boyne River, 15 miles upstream from Carman, Man., in an area where there has been a chronic shortage of water for livestock and domestic use. Work began in 1962 on the 2,100-foot-long embankment but was not completed by the end of the fiscal year.

#### Craik Community Storage Project

The Craik Community Project is on the Arm River 1 mile northeast of the town of Craik, Sask. The project consists of an earth-fill dam with a maximum height of 31 feet, a drop-inlet spillway, a riparian outlet, and an emergency spillway. The reservoir has a capacity of 5,000 acre-feet of water for stock watering and irrigation. It was constructed in 1962 for the Rural Municipality of Craik.



The Craik Community Project provides storage for 5,000 acre-feet of water for stock watering and irrigation.

Ref. No. 23424



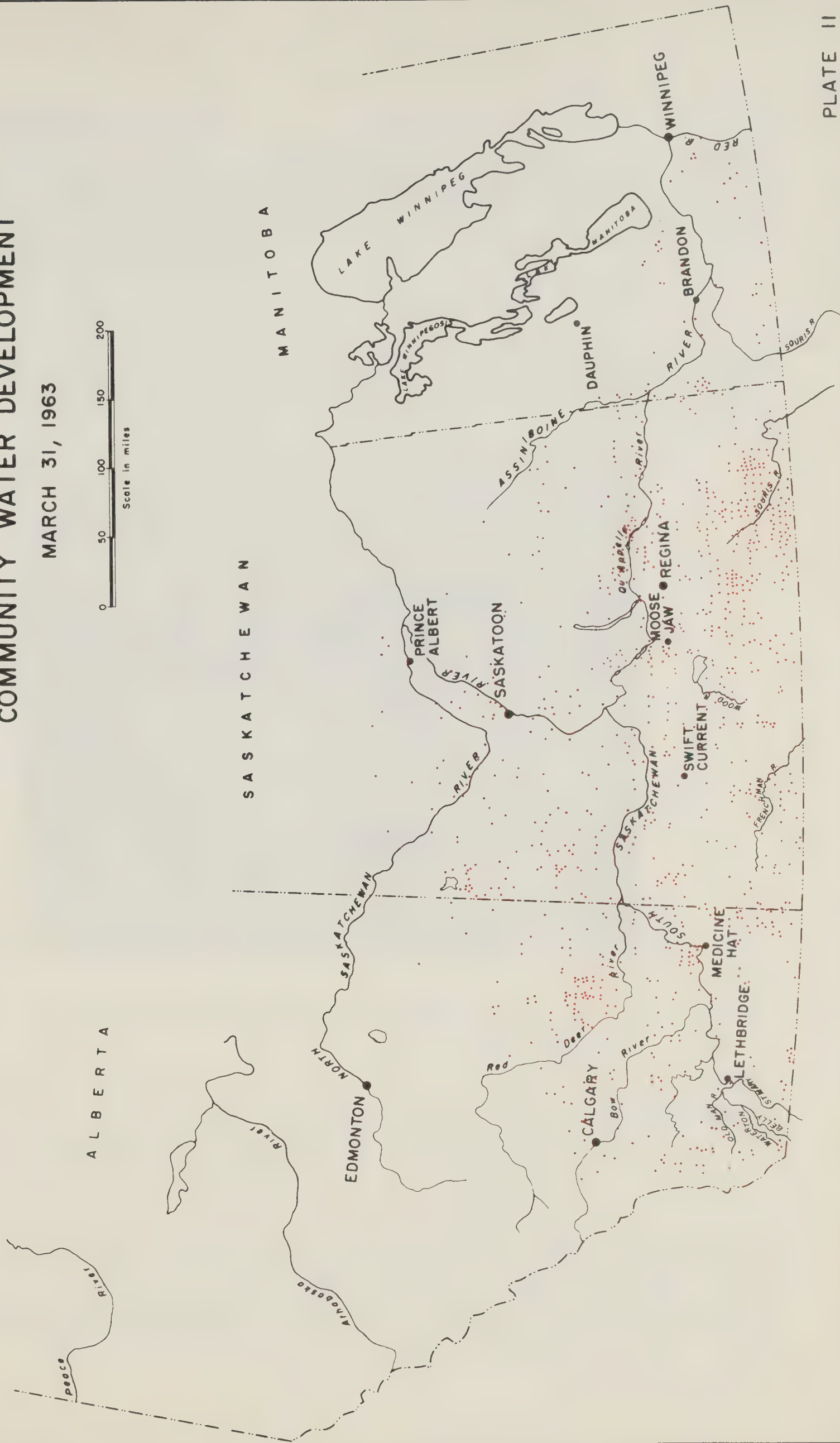
In the extreme southeast corner of Saskatchewan water for agricultural uses is placid behind the gated-chute spillway at the Gainsborough Dam.

Ref. No. 23884



# COMMUNITY WATER DEVELOPMENT

MARCH 31, 1963







### Gainsborough Community Project

The Gainsborough Community Project, constructed to provide water for livestock and irrigation, is on Gainsborough Creek, 3 miles east and 5 1/2 miles south of the town of Gainsborough. The earth-fill dam 26 feet high, creates a reservoir capable of storing 900 acre-feet of water. The project was built in 1962 for the Rural Municipality of Argyle.

### Weyburn Water-storage Project

This project was constructed in 1941 for the Government of Saskatchewan to supply the needs of a provincial mental institution and some urban requirements. During 1962, a new concrete, gated-chute spillway was constructed for the project,



A new concrete-chute spillway nears completion at the Weyburn Dam.

Ref. No. 23109-6

which is located 6 miles southeast of Weyburn. The cost of constructing the new spillway was shared equally by the federal and provincial governments.

### Redvers Dam (Lightning Creek Project)

The earth-fill, stock-watering dam, 17 feet high, creates a reservoir capable of storing 140 acre-feet of water. A three-bay, concrete-pier and stop-log structure in the center of the dam is available for passing peak flows. The structure is on Lightning Creek about 1 mile north of the town of Redvers, Sask. It was constructed in 1962 for the Rural Municipality of Antler.

## West Poplar Project

This project was begun in 1961 and completed in 1962. The dam creates a reservoir with a storage capacity of 1,000 acre-feet of water, which will be used for irrigation and stock watering. The dam, on a branch of the West Poplar River 12



Early construction activity on the West Poplar Project built for the Province of Saskatchewan.

Ref. No. 23092-12

miles southwest of Wood Mountain, was constructed for the Province of Saskatchewan.

## Kettlehut Lake Dam

This dam, on the east end of Kettlehut Lake, impounds 8,200 acre-feet of water. It was built by Canada in 1948-49, and for several years during the 1950's augmented the water supply of Moose Jaw, Sask., through a diversion system. This year, however, it became necessary to replace the existing spillway which had fallen into disrepair, and on completion of the structure it was turned over to the Rural Municipality of Enfield for operation.

## Summercove Dam

Initial construction of the Summercove Dam took place in 1949. In 1962 work began on raising the embankment by 2 feet and on construction of a new spillway. This work was suspended following winter freeze-up with about 60 percent of the main fill and 30 percent of the concrete work on the spillway completed. The dam is on the Wood River about 4 miles west of Summercove, Sask.



### Avonlea Creek Project

A 38-foot-high dam, creating a reservoir with a 6,000-acre-foot capacity, is being built 2 miles southeast of the town of Avonlea, Sask. Fencing and reservoir clearing was all that was accomplished in the fall of 1962. When completed, it will provide water for stock watering and irrigation.

### Theodore Dam

Clearing the reservoir area and fencing the construction site left everything in readiness for construction of the Theodore Dam, which is scheduled for completion in 1963. This project will consist of an earth-fill dam 45 feet high, a riparian outlet pipe and a concrete-chute spillway. The reservoir will have a capacity of 12,000 acre-feet and will supply water for agricultural uses along the Whitesand River between the dam and Canora, Sask.

### Carolside Dam (Berry Creek Project)

Excavation for a new spillway at the Carolside Dam near Carolside, Alta., commenced in the fall of 1962, and concrete was poured in November. The project was halted in midwinter, due to cold weather, and will be completed in 1963. Completion of construction will allow for storage of 30,000 acre-feet of water for irrigation of 10,000 acres of land.

### Technical Assistance

In addition to providing financial assistance for farm and community projects, agricultural and engineering field services were supplied free by the Water Development Service in 1962-63. These included 18,690 calls covering preliminary and final inspections, investigations and field surveys.

### Irrigation Projects

Canada is responsible for the operation of irrigation projects in Saskatchewan and Alberta. These projects were developed to help rehabilitate farmers whose land, in many cases, was taken out of production and placed in community pastures. Six small projects are operated in southwest Saskatchewan, and the federal government operates the Bow River Irrigation Project in Alberta.

### Southwest Saskatchewan Projects

The six projects in Saskatchewan are at Val Marie, West Val Marie, Consul, Eastend, Maple Creek and Swift Current. Over 38,000 acres of irrigable land in these projects have been made available to farmers and ranchers in surrounding districts for the production of livestock feed. About 35,000 acres of this land was irrigated during 1962, producing over 40,000 tons of hay for some 600 farmers using the projects and making it possible to maintain close to 50,000 head of livestock in the areas.



A wide expanse of water covers a hay field near Rush Lake on the Swift Current irrigation project. The main canal is in the foreground.

Ref. No. 22819

### Bow River Project

The Bow River Irrigation Project in southern Alberta lies between the Bow River and the Oldman River west of Medicine Hat. There are 240,000 irrigable acres in the project, as follows:

West Block	25,000 acres
Central Block	
Vauxhall	63,000
Hays	27,000
East Block	120,000
Blackfoot Indian Irrigation District	<u>5,000</u>
Total irrigable acreage	240,000

The Central Block of the project is owned by Canada, having been purchased along with existing irrigation works to provide suitable land on which to settle farmers moved from other areas of the prairies. P.F.R.A. is responsible for the entire irrigation operation in this block, which consists of 90,000 acres.

The West Block includes the 25,000-acre Alberta Bow River Development controlled by the Province of Alberta, and the Blackfoot Indian Irrigation District of 5,000 acres operated by the Indians. Water for these two projects is supplied by Canada through its extensive system of canals, reservoirs and structures, which serve the entire area.



Alberta also owns the East Block, as yet undeveloped for irrigation. This is the area north of the Bow and South Saskatchewan rivers extending from the eastern edge of the Central Block to Medicine Hat.

Straightening and protection of main and lateral canals was continued in various parts of the system to reduce erosion of canal banks. In the Hays area, nine concrete drop structures were built for this purpose.

Improvement of drainage was another prime target during 1962-63. In the Vauxhall area construction of a drainage network continued; 78 concrete drops were built and 152 culverts were installed. In the Hays drainage area, P.F.R.A. placed 9,000 feet of new drains, 12 drainage inlets and provided one drainage well.

To expand the pasture acreage in the Hays area, a 25-hp. pump was operated to pump water for an additional 400 acres of pasture. Another 300 acres of land was leveled and an access road to this area was constructed.

A new hoist system was installed on the head gates at the Carseland diversion works to facilitate placing and removing stop logs. At the Travers Dam, the diversion culvert was filled with concrete.

A seepage problem on the main canal near Queenstown was rectified with the installation of a tile line.

During the crop season from April to October, 8.33 inches of precipitation was recorded at Vauxhall and 7.40 inches at Hays. Water delivered from the Little Bow Reservoir to the project amounted to 194,741 acre-feet, or a decline from the previous year of almost 37,000 acre-feet. Due to the depletion of water reserves in 1961-62, over 200,000 acre-feet of water had to be diverted from the Bow River in 1962-63. As a result, enough water was in storage at the end of the fiscal year to provide one season of irrigation without further diversion.

A program to control weeds on the canal banks, which has been carried on for several years, appeared to be paying dividends as the banks were almost free of weeds. Success in the control of aquatic weeds was experienced, also, with the use of Aqualin. Eight hundred gallons of the chemical was used on 25 miles of canals and laterals. Control of emergent water weeds, such as cattails and tules, was poor as a result of too much water in the drains.

Pastures operated at Hays and Vauxhall consisted of 2,800 acres of irrigated land and 4,100 acres of dry land. These areas carried 1,810 cattle and 2,000 sheep for 133 days.

An artificial-insemination program was started in the Hays pasture during the 1962 grazing season. About 600 cows were serviced during a 45-day period at an average cost of \$11 per head.



Large herds are grazed annually in this irrigated community pasture on the Bow River Irrigation Project.

Ref. No. 23051

At the request of the Research Branch, 41 acres of newly leveled land was seeded to Cypress wheat for multiplication purposes. The yield was 1,559 bushels. Another 400 acres were seeded to oats before seeding to permanent grass next year.

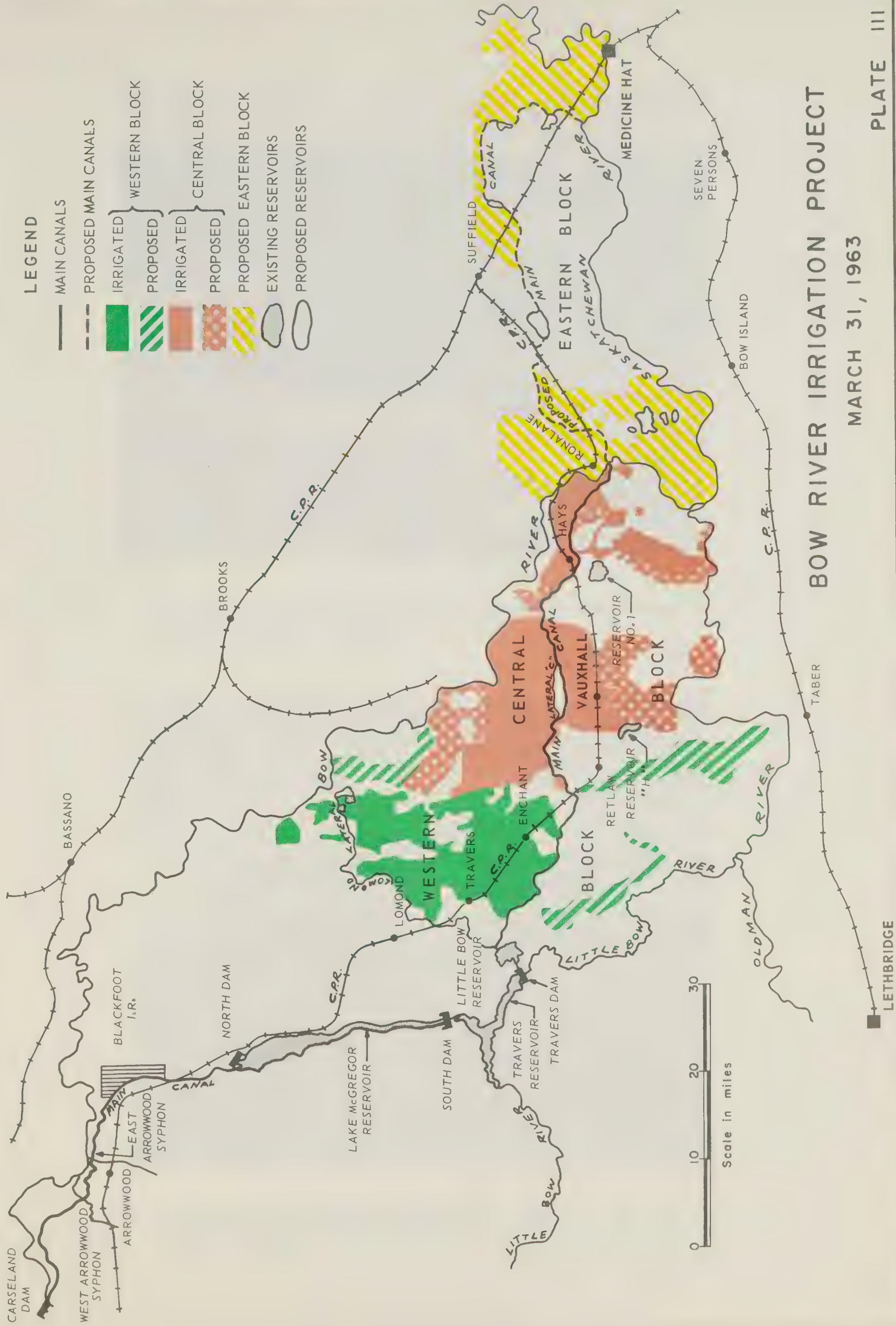
In general, yields of cereal crops and hay were above average. This is attributed to heavy fall irrigation in 1961 together with heavy use of water during the 1962 growing season. Better preparation of land and extension of land leveling have also improved the efficiency of irrigation.

Cattle feeding has shown a marked increase due to a plentiful supply of feed and the carryover of calves from 1961. Hog production has shown a slight increase due to a plentiful supply of oats and barley.

A limited acreage of sugar beets were grown by farmers on the project for the first time and were hauled to Taber for processing. Canning peas were also produced for shipment to Taber. Both of these crops were grown in small quantities. Potato production remained stable, 3,000 acres being grown for table use.

Cropping practices in the district are changing slowly from production of grain to hay and row crops. It is expected that the acreages in sugar beets, canning crops and potatoes will all be increased in 1963.











Water syphoned from an irrigation ditch on the St. Mary Project produces a bountiful sugarbeet crop.

Ref. No. 23111-3



Huge machines are employed on the potato harvest on the Bow River Project near Vauxhall, Alta.

Ref. No. 23218



## Project Maintenance and Construction

The Construction, Equipment and Supply Section acts as an operational service center to other divisions of P.F.R.A. These services include the operation of an equipment, supply and repair depot at Moose Jaw; and the provision of field services required in the construction and maintenance of P.F.R.A. projects where these are needed to supplement services usually provided by local contractors. The Section employs a regular staff of 79 skilled tradesmen, field construction crews, machine operators and office personnel, along with casual help as required. The inventory on all P.F.R.A. equipment, which is maintained by the Section, contains approximately 6,500 items and is valued at over \$4,500,000.

During 1962 the shop program included 219 repair jobs on vehicles, 75 trailer repairs and renovations, and repairs to 365 pieces of mechanical equipment. The cost of repairs, not including labor, was \$110,220.96 and the value of materials used in manufacturing equipment, forms and water troughs, was approximately \$44,000.

Part of the shop staff were also employed during the year installing and servicing plumbing, heating and electrical facilities at community-pasture headquarters, and a crew was established and equipped to paint pasture headquarters buildings. Both of these activities became necessary because local businesses were not interested in undertaking work of this nature at rural locations, usually some distance from established towns. The service crews worked at 62 pastures, and 13 pasture headquarters buildings were painted. The costs amounted to \$15,223.92 for labor and \$3,722.86 for paint and supplies, making an overall cost of nearly \$39,000.

The Maintenance and Construction Section worked on 119 jobs during the year. These included the completion of a large community water-storage project, placing plastic lining in a large irrigation canal, relining a reservoir outlet conduit, cleaning irrigation ditches, replacing timber and concrete structures and maintaining fireguards in community pastures. Some jobs involved several thousand dollars' expenditure, and included the use of equipment and personnel of local contractors: other jobs were minor in dollar value, but required special equipment or techniques that the Section could provide. Transportation of nearly 4,400 tons of equipment and materials to locations throughout the Prairie Provinces required over 151,000 miles of truck travel and the Section continued to maintain a system of cost records on all phases of its operation.

The Stores Section handled construction materials, supplies, equipment and repair parts amounting to over \$428,000.

The Fire Prevention and Safety Program was continued throughout the year. A first aid course was arranged for foremen and field personnel, and periodic lectures and films relating to safety measures were sponsored whenever there was an opportunity. The good fire prevention and safety record indicates the merit of these endeavors.





Plastic sheet lining has proven effective in reducing seepage from canals on the Swift Current Irrigation Project.

Ref. No. 23361-3

#### Predevelopment Farm

The Predevelopment Farm is operated independently of the construction of the South Saskatchewan River Project, and is intended to provide information related to irrigation and other agricultural developments which will take place in the area when water from the reservoir is available.

The farm was established in 1949, and many of the crop and water-use records cover a 12-year period. Basically, the farm has followed a 10-year crop-rotation pattern, with new varieties of forage and cereal crops introduced when they might provide useful information.

Field corn and sunflowers were grown for the first time in 1962 with considerable success, while fewer potatoes were grown. Crop yields were similar to those for other years except for potatoes, which have had an inconsistent record and were below normal in 1962.

Mechanical grazing was continued for the third year and added further information on the possibilities of growing a limited acreage of high-value forage crops on an irrigated farm. Production from 10.7 acres of alfalfa and grass mixture was 914.8 pounds of beef per acre.

With increased precipitation during the year, the amount of irrigation water required was considerably reduced, while labor costs in the application of water were also reduced through the use of wheel-move sprinklers on 48 acres.



Flood irrigating a field of oats on the Predevelopment Farm near Outlook, Sask.

Ref. No. 22951



Wheel-type sprinkler irrigation system being tested for use at the Predevelopment Farm, Outlook, Sask.

Ref. No. 23111-5



The facilities of the farm were used by the Research Branch and by the Agricultural Engineering Department of the University of Saskatchewan to conduct tests on crop response and water-application efficiency. The farm also cooperated in the establishment of an agrometeorological station by the Meteorological Division of the Department of Transport.

Public interest in the farm increased during the year and improvements were made to better accommodate the growing number of visitors.

It is proposed to continue the farm operation on a similar pattern next year, with new varieties and crops to be introduced. Further cooperation with research agencies is also planned.

## LAND USE SERVICE

The conversion of submarginal land from cereal crop production to pasture was early recognized to be one of the necessary adjustments in land use in the drier areas of the Prairie Provinces. Thus in 1937, two years after the Prairie Farm Rehabilitation Act was passed, an amendment provided for the removal of submarginal land from cereal production and seeding it to grass for pasture. It also provided for moving farmers from problem areas to more suitable regions where a reasonable standard of living could be realized. For further information on the resettlement of farmers from submarginal areas, see the section of this report entitled "Irrigation" under the main topic heading "Water Development Service."



Farmer delivering cattle for summer grazing in Foam Lake Community Pasture in northeastern Saskatchewan.

Ref. No. 23640

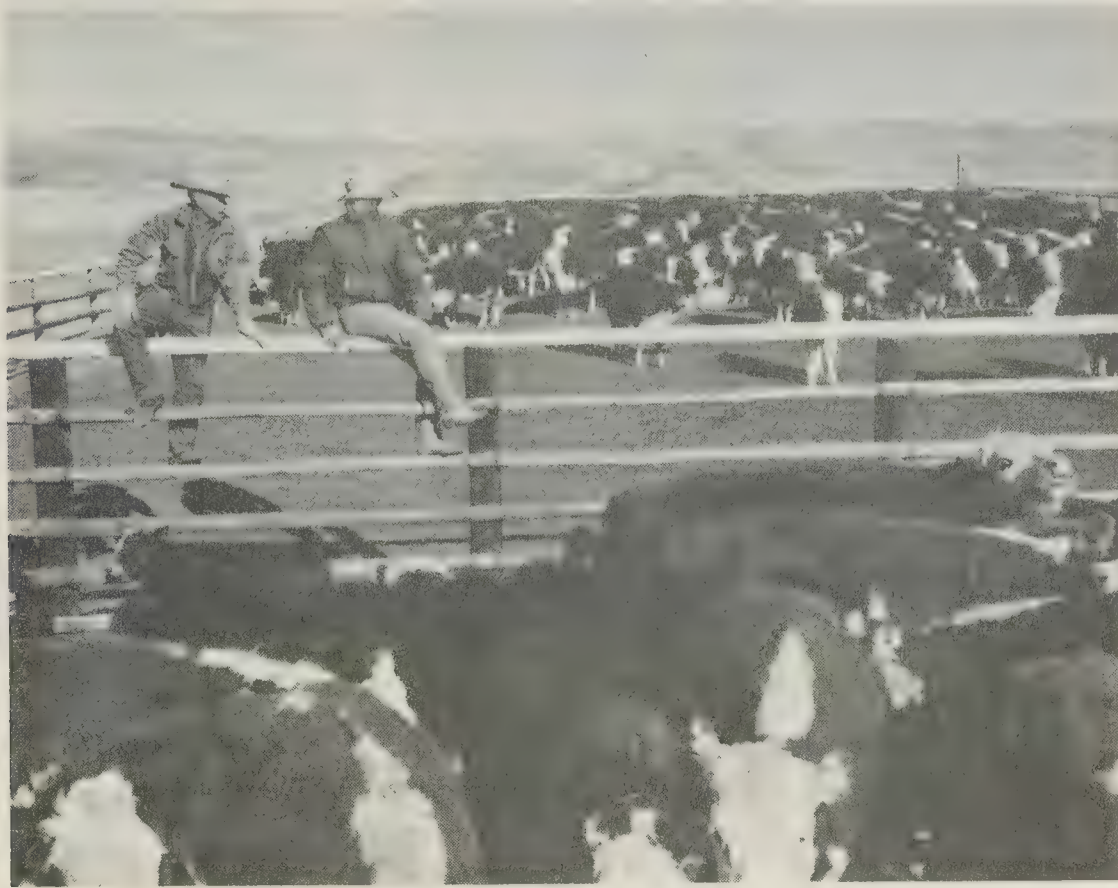
The community-pasture program has grown steadily since the first land unsuitable for cultivation was fenced, seeded to grass and otherwise developed for pasture. In 1962 P.F.R.A. operated 72 pastures embracing 2,109,700 acres of land. These units are divided into six supervisory districts with offices at Regina, Brandon, Swift Current, Kindersley, Saskatoon and Weyburn. During the year, 7,342 farmers and stockmen grazed 138,643 head of cattle, 753 horses and 2,735 sheep in the pastures.

### Pasture Operations

In contrast to 1961, when severe drought left most pastures with low water reserves and subnormal grass cover, the condition of pastures at the close of the 1962 grazing season was generally good. This was due mainly to adequate rainfall during the summer. About 6,000 fewer cattle were admitted to the pastures since the drought in 1961 considerably reduced the grass carryover in many pastures.



Three new pastures went into operation in 1962. The Gardenton pasture in the extreme southern part of Manitoba carried 852 head of livestock, and the Wallace pasture near Virden, Man., handled 741 cattle. The Valeport Flats near Craven, Sask., was also pressed into service as a bona fide pasture, after having served the previous year as a holding area where cattle were fed a ration of screenings pellets.



In good shape following a summer of grazing on the Suffield Community Pasture in Alberta, these animals have been rounded up and sorted into pens.

Ref. No. 24445

Two new pastures were developed during 1962, both in Saskatchewan. They are the 10,400-acre Foam Lake pasture south of Margo and the Kelvington pasture, north of Kelvington, which contains 8,160 acres. Both will go into operation in 1963. Construction was begun on a third pasture in the Spiritwood area of northern Saskatchewan. Eight other such grazing areas have been approved for construction in 1963, three in Saskatchewan and five in Manitoba.

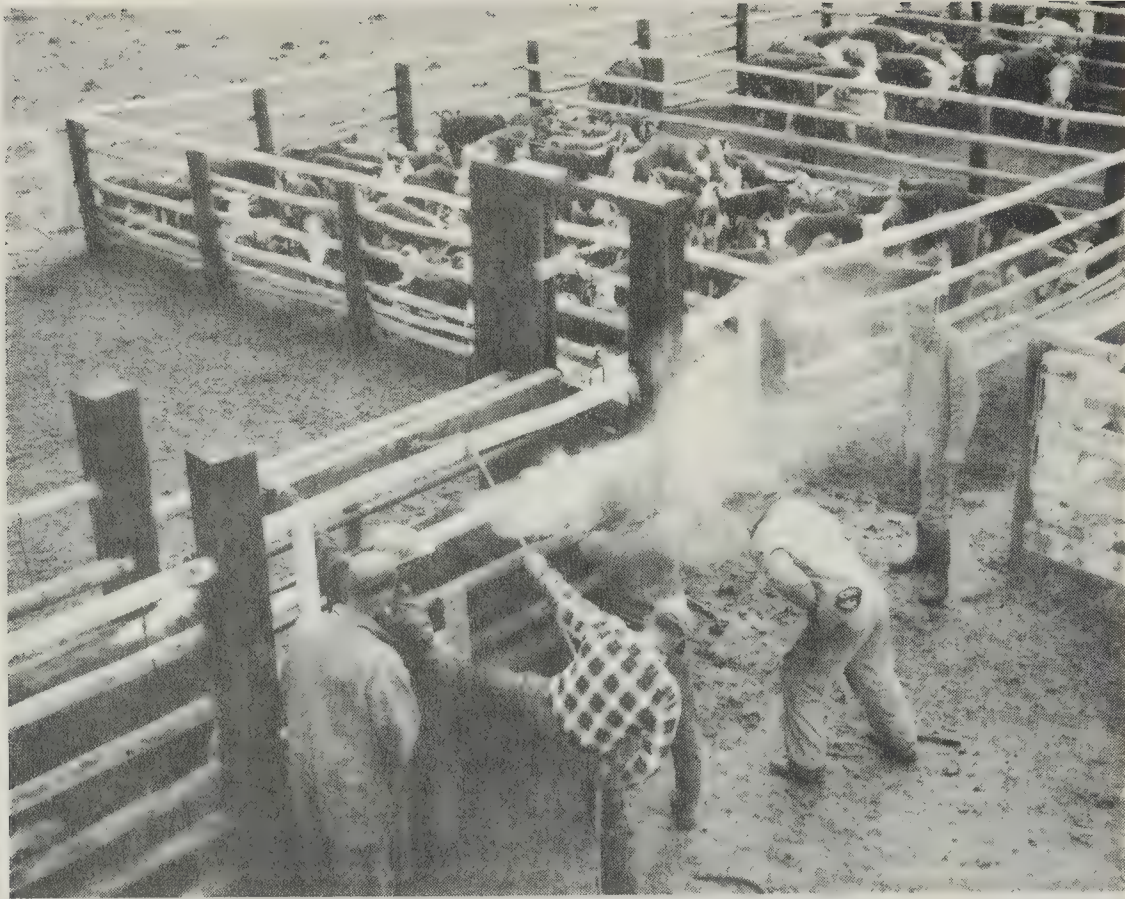
#### Pasture Services

Taking into consideration such factors as grass carry-over, soil moisture and available stock water, P.F.R.A. each year establishes the carrying capacity of the various pastures. Using this figure as a guide, the maximum number of stock per patron is established for the next grazing season.

#### Haying and Regrassing

About 5,450 tons of hay and green feed were harvested on community pastures by managers with help from adjacent farmers, who put up hay on a share basis. This fodder is used to feed pasture bulls and headquarters stock.





A full range of services are provided at P.F.R.A. Community Pastures. Here an animal is being branded at the Laurier Pasture in Saskatchewan.

Ref. No. 23601

A total of 3,413 acres were regrassed, 400 acres being sown to crested wheatgrass, 855 acres to brome grass and crested wheatgrass mixtures, and 2,185 acres to other mixtures.

#### Fires and Fire Protection

More favorable weather conditions in 1962 reduced the fire hazard in community pastures over that of the previous year. A few small fires were caused by lightning, but these were quickly controlled and losses were negligible.

Motorized units working out of Moose Jaw maintained 1,169.5 miles of fireguards and constructed 67.5 miles of roads that serve as fireguards in 31 pastures.

Fireguarding using chemicals rather than more conventional methods was attempted in P.F.R.A. community pastures for the first time in 1962 on a trial basis. About 80 miles of fireguards were sprayed with simazine and another 80 miles with the chemical Telvar. A similar area will be sprayed during 1963.

#### Grasshopper Control

In a program to control grasshoppers, 20 pastures consisting of 15,873 acres, were sprayed with the insecticide carbaryl. Spraying was carried out both on the ground and from the air.



# COMMUNITY PASTURES - MARCH 31, 1963

## 71 OPERATING PASTURES

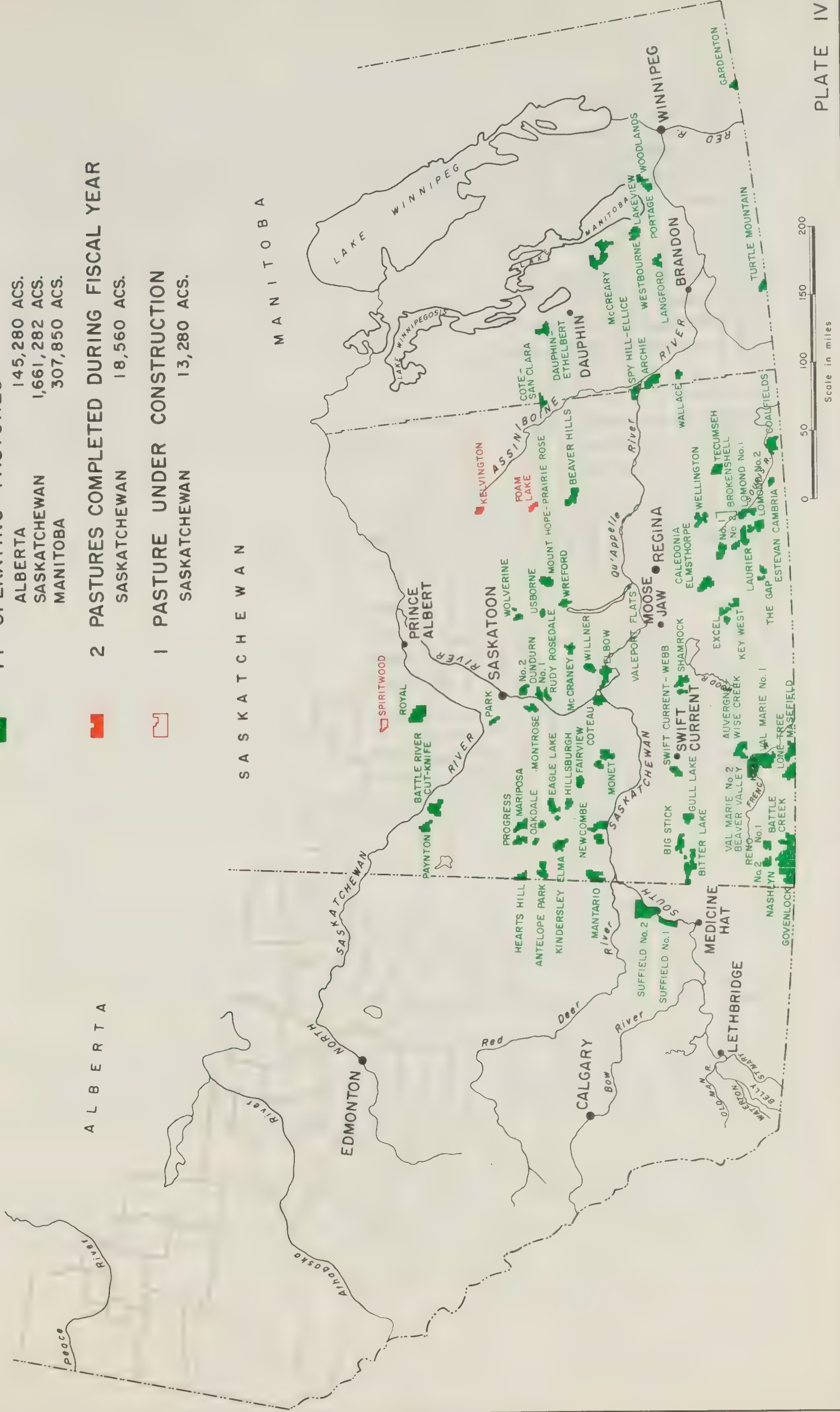
ALBERTA 145,280 ACS.  
 SASKATCHEWAN 1,661,282 ACS.  
 MANITOBA 307,850 ACS.

## 2 PASTURES COMPLETED DURING FISCAL YEAR

SASKATCHEWAN 18,560 ACS.

## 1 PASTURE UNDER CONSTRUCTION

SASKATCHEWAN 13,280 ACS.







## Breeding Service

P.F.R.A. again provided extensive breeding services using purebred beef-breed bulls for the benefit of patrons using community pastures. During 1962, P.F.R.A. supplied 1,023 bulls and 396 were rented from patrons. Service was provided for 40,671 breeding cows.

To maintain an adequate supply of bulls, P.F.R.A. purchases many yearlings and develops them at bull stations in the Archie and Bitter Lake pastures. During 1962-63, P.F.R.A. purchased 256 bulls - 222 Hereford, 33 Charolais and 1 Aberdeen Angus. Two hundred and seven of these were yearlings and 49 were two-year olds.

The breed of bulls is selected by the patrons, who decide at the organization meeting which breed they wish to have in the pasture. This decision can be changed at the annual meetings by a majority vote.

The bulls are supplied to the pastures at a rental of \$40 per year per bull. This, together with breeding fees, balances the cost of the breeding service with the cost of supplying the bulls, based on the average cost of bulls, length of service and salvage value.

During 1962, four pastures participated in an artificial-insemination program, under which P.F.R.A. assumed the cost of the semen, supplied facilities and provided clean-up bulls. Local committees supplied the technician and assumed responsibility for all other aspects of the operation. In 1962, the Teo Lake Artificial Breeding Co-op serviced 244 cows artificially in the Kindersley-Elma pasture and 283 in the Eagle Lake pasture. At Laurier pasture, 661 cows were bred artificially, and at Wellington pasture 334 cows were serviced. Both of these A.I. operations were handled by the Weyburn Artificial Breeding Co-op.

## Livestock Diseases

There were no serious outbreaks of disease in community pastures during 1962. The more-common afflictions, such as pinkeye and foot rot, responded well to treatment in most instances. Effective control of warbles and lice was maintained by spraying the animals with the insecticide coumaphos. Back scratchers were most useful in control of external parasites such as lice, ticks, horn flies and mosquitoes.

Due to consumption of a weed that became prevalent as a result of dry conditions and overgrazing in 1961, some cattle in southwestern Saskatchewan developed a condition diagnosed as mucosal complex (photosensitization). These animals responded well to antibiotic treatment.

All cattle in P.F.R.A. pastures are subject to local municipal bylaws and Health of Animals regulations pertaining to control of brucellosis and tuberculosis. As a protective measure, a growing number of pastures engage veterinarians during roundup to vaccinate heifer calves against brucellosis.

## Livestock Insurance

Mutual insurance schemes, covering varying percentages of losses depending on premiums paid, were carried by 42 pastures. Of a total of 793 casualties in all pastures, 460 were covered by insurance. The accumulated surplus of the mutual insurance funds at March 1, 1963, was \$64,294.58. The total losses of animals in 1962 averaged just over 0.5 percent of the number of livestock pastured.

## Pasture Construction

Nine construction crews and four water-development crews were involved in construction of the new Foam Lake, Kelvington and Spiritwood pastures and in other pasture development. Part of their work was to fence 33,440 acres of land, requiring 181.5 miles of fence.

The following table shows the activities of the various crews. Under the heading "Water Development," not all work was done by P.F.R.A. crews, as some construction requiring heavy equipment was contracted to private concerns.

### Summary of Pasture Construction Activities - 1962-63 Season

Particulars	New projects completed in 1962	Repair work completed in 1962	Total to March 31, 1963
Fencing (miles)	181.5	23	5,048.5
Corrals	3	6	174
Pasture-managers' dwellings	1	9	64
Riders' cabins	1	1	36
Barns	1	3	64
Garages	-	4	64
Bull sheds	1	3	61
Others (granaries, oil sheds, chicken coops, pump houses, etc.)	6	3	194

### Water development

Windmills	25	6	507
Wells	35	71	474
Dugouts	54	72	847
Dams	2	2	286
Springs	4	2	216

*Total acreage enclosed at March 31, 1962 . . . . .	2,099,532
Total acreage enclosed during 1962 construction season . . . . .	33,440
Total acreage enclosed at March 31, 1963 . . . . .	2,132,972

\*Corrected figure from that stated in 1961-62 Annual Report.



## Pasture Improvement

Pasture-improvement work during 1962-63 included mainly activities in the field of irrigation development, regrassing, land clearing and brush control. Other work consisted of development of stock-watering facilities, fireguarding and irrigation surveys.

Flood irrigation schemes embracing 1,150 acres of land were completed during the year in the Masefield and Wellington pastures. A start was also made on the development of a 150-acre, border-dyke, gravity system of irrigation in the Govenlock pasture.

Forage production on areas set aside in pasture irrigation projects for haying amounted to 1,300 tons.

Forage seeding of 1,400 acres on various flood irrigation schemes was undertaken in the Battle Creek, Reno No. 1 and Bitter Lake pastures. Regrassing of 1,900 acres of reclaimed farmland was completed in the Masefield, Swift Current-Webb, Eagle Lake, Kindersley, Monet and Progress pastures. Cultivation for regrassing was also completed on 500 acres of land in the Bitter Lake and Beaver Hills pastures.



This steel ball is 4 feet in diameter and weighs 4 tons. It is one of the key components in equipment used for clearing brush by the ball and chain method.

Ref. No. 23503



Vast areas can be cleared quickly using the ball and chain method perfected by P.F.R.A.

Ref. No. 23507

Chemical spraying for the control of western snowberry in the Coalfields, Mariposa and Rudy-Rosedale pastures covered 1,700 acres; and spraying for the control of poplar growth was carried out in the Cote-San Clara and Battle River-Cutknife pastures.

Land clearing by the ball and chain method was carried out during February and March, when 6,700 acres were cleared. This work was done in the Beaver Hills, McCreary, Cote-San Clara, Dauphin-Ethelbert and Langford pastures at an average cost of \$2.10 per acre. It will be followed by brush burning and herbicidal spraying two years after the clearing operation.



## ENGINEERING SERVICES BRANCH

The Engineering Services Branch continued to provide the engineering required for the investigation, planning, design and construction of P.F.R.A. projects. In addition, services were performed for the International Joint Commission, the Prairie Provinces Water Board and the Greater Winnipeg Floodway Advisory Board.

A considerable part of the engineering work performed in all divisions was centered on the design and construction of the South Saskatchewan River Project and the St. Mary Irrigation Project, where activities are continuing according to schedule.

Regional engineering offices in Manitoba, Saskatchewan and Alberta, provided the services required in connection with the investigation, planning and construction of works under the P.F.R.A.'s water-development program.

### Design Division

As has been the case for several years, the main activity of the Design Division was related to the planning, design, and preparation of specifications for contracts associated with the South Saskatchewan River Dam.

Plans and specifications were also completed for eight water-development projects on which contracts were eventually awarded. They are the Avonlea Dam, Carolside Spillway on the Berry Creek Project, Crystal City Project, Gainsborough Dam, Redvers Dam, Stephenfield Dam, Theodore Dam and repairs and improvements on the Summercove Dam.

Plans for renovations and repairs for two structures on the Bow River Project were also prepared, the work being carried out by P.F.R.A. forces.

Detail study proceeded on the Conjuring Creek Project and on the Esterhazy and Mossy River dams. Preliminary studies continued on the Shellmouth Dam, which is part of the Assiniboine River Project. In addition, elementary designs and preliminary cost estimates were prepared for the Pincher Creek Project, and the Plato, Wawota and Welwyn dams. Other studies involved the Coulter and Vanguard dams and the Dalroy Flume.

The hydraulic laboratory operated by the Design Division was used to capacity. Modeling work was completed on the Craik and Avonlea projects. Hydraulic model studies were also made on the forebay area of the South Saskatchewan River Dam spillway and of the spillway crest.

### Drafting Section

Over 1,300 finished drawings were produced by the Drafting Section during the fiscal year, with print reproductions amounting to 328,000 square feet.



A technician gathers information on the performance of this hydraulic model simulating conditions to be encountered at the South Saskatchewan River Dam.

Ref. No. 22222

Close to half the man-hours involved in this work were expended on drawings associated with the South Saskatchewan River Dam. Besides preparing plans for other projects, significant assistance was rendered to other sections of P.F.R.A.

#### Air Photo Analysis and Engineering Geology Division

Geological mapping of excavations in the shale at the South Saskatchewan River Project continued to play a large part in the Division's activities. A report on the excavations for the control shafts was completed and the final report on the tunnels is nearing completion.

Engineering geology studies continued at The Gap damsite on the Oldman River and a preliminary geological report was submitted.





Air-photo studies were conducted to aid in the selection of possible dam-sites on Wolf, Bullpound, Threehills, Kneehills and Ghostpine creeks in Alberta. Similar studies were made on the Antler, Gainsborough, Moose Mountain, Broken-shell and Eaglehill creeks in Saskatchewan, and on the Valley and Long rivers in Manitoba. Included in the air-photo studies were searches for riprap materials for the Sarnia and Boxelder projects, and a study of irrigable areas along the Souris River from Oxbow to the Canada-United States boundary.

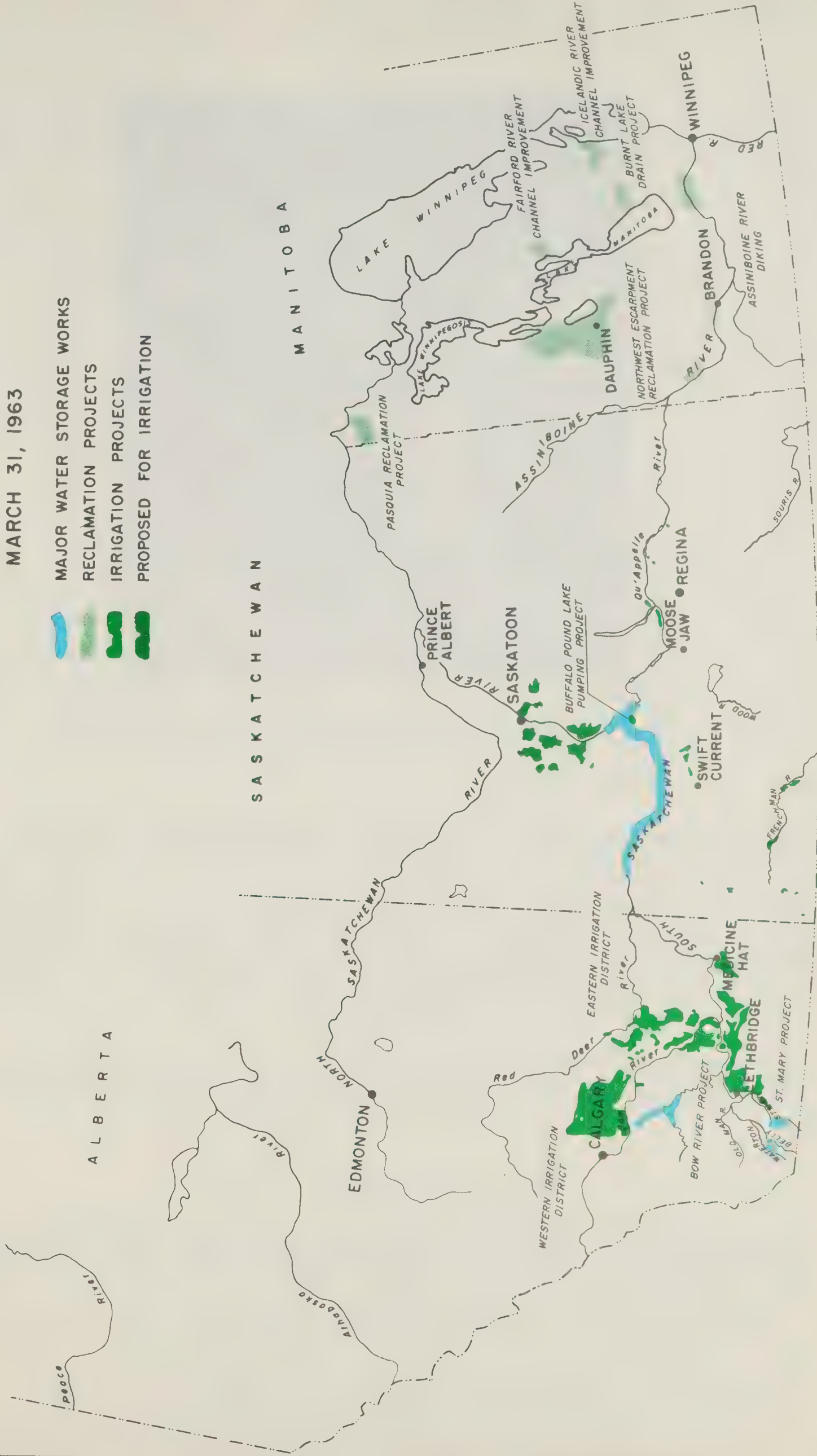
Detailed air-photo studies were completed to assist in the planning and construction of the Livingstone and Hazel Dell community pastures, while cursory studies were made for several ARDA community-pasture proposals.



# MAJOR IRRIGATION AND RECLAMATION PROJECTS

MARCH 31, 1963

-  MAJOR WATER STORAGE WORKS
-  RECLAMATION PROJECTS
-  IRRIGATION PROJECTS
-  PROPOSED FOR IRRIGATION



0 50 100 150 200  
Scale in miles







Looking north along the center line of the proposed Gap Damsite currently under investigation.

Ref. No. 23035-2

Large-scale photogrammetric mapping for a potential irrigation area in the Blood Indian reserve in Alberta and for the Shellmouth damsite on the Assiniboine River in Manitoba was completed. The mapping of damsites and reservoir areas was completed on the Melfort Creek, Roughbark Creek, Assiniboine River, Swan River, Penticton Creek, Antler River, Moose Mountain Creek, Qu'Appelle River, Little Pipestone Creek, Pembina River and Wascana Creek. Included in the photogrammetric-mapping program were planimetric maps showing surface geology on the Beaver River and areas subject to periodic flooding along the Paddle River.

New air-photo coverage was acquired for southwestern Saskatchewan through the Interdepartmental Committee on Air Surveys. This coverage was flown in 1962 at a scale of 1 inch equals 1,320 feet and includes townships 1 to 21 and ranges 20 to 30, west of the third meridian.

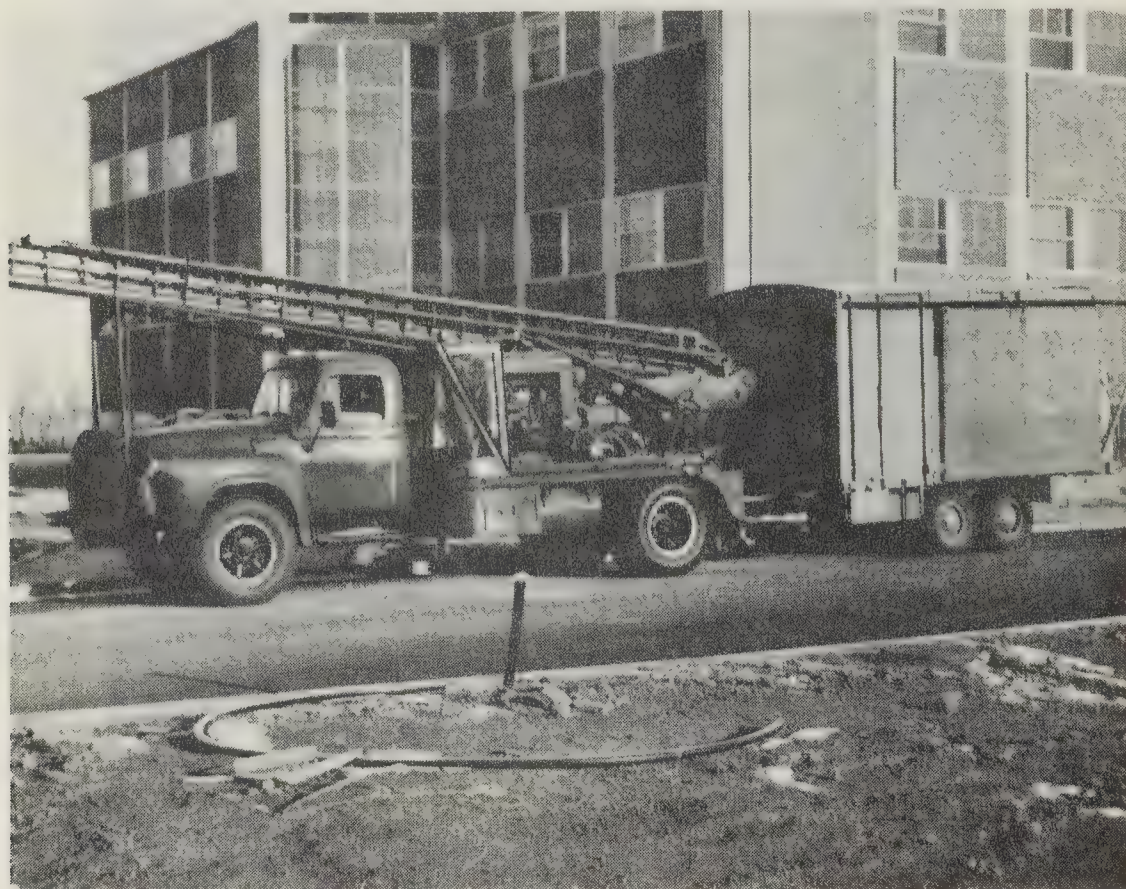
#### Soil Mechanics and Materials Division

In 1962, field crews drilled 38,000 lineal feet of test holes, over half of which were drilled at the South Saskatchewan River Dam and the Assiniboine River Project (Shellmouth site). The remainder of the drilling was done on 22 other sites in Manitoba, Alberta and Saskatchewan. Laboratory testing was carried out on samples from every site, plus samples submitted from works under construction.

Design studies and engineering reports were prepared for 40 projects or phases of investigation. Some of the more unusual investigations reported on were: the strength of clay along the Red River Floodway near Winnipeg; investigation of artesian pressure in the Belly River formation, which underlies the shale and



riverbed sand at the South Saskatchewan River Dam; the suitability of anchor piles for resisting expected upward movement of shale in the stilling-basin area of the South Saskatchewan River Dam spillway; the suitability of various types of grout for use behind the tunnel lining at the South Saskatchewan River Dam; and a design study on the size of rock needed and its availability, for protecting the upstream faces of the



A truck-mounted drilling rig leaves the Soil Mechanics Laboratory grounds on a field assignment where it will gather soil samples for analysis.

Ref. No. 24548

Qu'Appelle River and South Saskatchewan River dams. Studies were also made on the magnitude of temperature rise that might be expected, both with and without fly ash, in the mass concrete sections of the South Saskatchewan River Dam spillway.

Field laboratories were maintained during construction of the Waterton Dam in Alberta, and the Deloraine and Stephenfield dams in Manitoba. Here tests were run on various types of materials going into the structures. A continuing program of measuring settlement, foundation movement, frost penetration and water levels at completed structures was maintained during 1962-63.

#### Hydrology Division

The activities of the Division during the fiscal year covered a wide range of hydrological subjects. Flood-frequency, water-supply, hydrometeorological and other hydrologic studies concerning 57 P.F.R.A. projects were conducted and over 80 reports and memoranda were prepared.

The Division continued to serve as Secretariat to the Prairie Provinces Water Board and carried out studies for the Canadian members of the International



Souris River Board of Control. A number of interprovincial and international watershed studies were carried out to assist these boards in the equitable distribution and impartial control of water.

A meteorologist, seconded from the Department of Transport, continued to work in the Division and made good progress on studies relating to probable maximum rainfall, prairie snowpacks, frequency of point rainfall, wind analysis and evaporation.

Because of drought, field investigations of flooding were not required. However, a bucket survey was made of an unusual rainfall in southwestern Saskatchewan that produced up to 10 inches of precipitation in 24 hours. Some miscellaneous field work was undertaken in connection with watershed studies and minor flood problems.

### Surveys

A change in the method of operations of the Legal Survey Section was adopted and proved effective during the year. The Section closed its Lethbridge survey office, and formed a permanent staff operating out of Regina. Excess work was contracted to private survey firms, eliminating the need for hiring and training temporary employees.

The main task of the Section in 1962 was to resurvey completely the Eastend Irrigation Project. The survey affected 54 quarter sections and included lot boundaries, supply canals, drains, access roads, road diversions, river traverse and the subdivision of 12 new lots. In addition, a complete summary of title requirements for this and the Consul Project was prepared for the Land Division.

Legal surveys were made of the reservoir rights-of-way for the following projects: Muenster Community Storage, Kettlehut Lake Dam and Reservoir, Avonlea Creek Reservoir, Chapleau Lake Storage, Keyser Community Storage, Summercove Storage, Boharm Community and Coral Community.

Various other surveys were completed in the Regina, Francis Lake, Tatagwa, Cypress Lake, Val Marie and Swift Current districts.

### Major Construction Projects

The following is a review of major construction projects on which work was carried out during the year.

#### St. Mary Irrigation Project

The St. Mary Irrigation Project in southern Alberta involves the construction of works to irrigate approximately 500,000 acres of land. Water to meet irrigation needs is provided by Canada's share of three international streams, the St. Mary, Belly and Waterton rivers.



As the result of an agreement between Canada and Alberta, Canada has paid the cost of engineering, supervision and construction of the main storage and diversion works and connecting canals since work on the project began in 1946. Canada is reimbursed for the operation and maintenance of the main reservoirs and canals through the sale of water to Alberta for irrigating the area, at a price not in



The main embankment of the Waterton Dam is almost complete in this picture, while the spillway is under construction at the left.

Ref. No. 23660

excess of 25¢ per acre-foot. In 1962, this revenue was sufficient to cover the costs of operation and maintenance. Apart from purchasing water, Alberta's responsibilities lie in financing construction of the main canals from Ridge Reservoir east and the distribution system from the main works to the individual areas, engineering services for the entire project being provided by Canada. This cost to the province is partly defrayed through an assessment of \$10 per irrigable acre paid by each farmer associated with the project, plus an assessment to the farmer for all operation and maintenance costs.

The St. Mary and Belly rivers have been harnessed and storage has been provided to make the most efficient use of these two rivers. Work is almost completed on the Waterton Dam, which will control waters in that river. A diversion canal from the new reservoir to the Belly river will complete the link between the three streams.

Capital costs to the two governments to March 31, 1963, are as follows:

Government of Canada (P.F.R.A.)	\$27,199,000
Government of Alberta	19,584,000









Engineering and construction - Designing and planning of the diversion canal from the Waterton River to the Belly River was carried out during 1962, as was similar work on the Waterton Dam diversion tunnel and the spillway. Surveys and investigations were continued on the distribution systems yet to be built.

Construction of the embankment for the Waterton Dam was 95 percent completed. Two other contracts made good progress, one for construction of the spillway and the other for clearing the reservoir of trees and brush.

Operation and maintenance - Precipitation in the project area was well below normal, resulting in the use of a record 525,430 acre-feet of water for irrigation. This increase in the volume of water used was partly due to the additional 7,800 acres brought under irrigation in 1962-63. The acreage of irrigable land in the old and new sections of the project now totals 220,000 acres.

P. F. R. A. maintenance crews made minor alterations and additions to existing works and constructed drains along the main canal to control seepage, in addition to their general maintenance work.

Agricultural development - Mechanized sprinklers for water application are being used by some of the former large-scale, dry-land farmers. Several of these sprinklers are capable of irrigating 160 acres at one setting.

An increase in acreages of specialty crops was recorded during the year. Irrigated crop acreages in 1962 in southern Alberta were as follows:

Green vegetables and canning crops	16,130 acres
Potatoes	10,100
Sugar beets	42,000
Sunflowers	2,000
Seed crops (for oil)	36,370
Fodder crops (alfalfa, etc.)	248,700

Due to excellent markets, livestock production and sales continued to increase. The gross value of livestock sales from the Lethbridge area was about \$31,750,000 in 1962 compared with \$25,300,000 the previous year. Since 1959, the sale of cattle and calves has increased each year, while hog and sheep marketings have declined. During this period, the value of livestock sales has risen from \$22.2 million to \$31.75 million.

Recreation - Many of the reservoirs on the project are being used for public recreation. Four boat clubs have been licensed to use the St. Mary Reservoir. Several municipalities have made enquiries regarding development of parks in the reservoir area, and these are being considered. Most of the larger reservoirs have been stocked with game fish and commercial whitefish.

## South Saskatchewan River Project

The South Saskatchewan River Dam is the main structure in the long-range plans for control and development of the South Saskatchewan River. The reservoir that will result from construction of this dam, together with another large dam in the Qu'Appelle Valley, will store water to be released for irrigation, hydroelectric power development, and other agricultural and domestic uses. The reservoir will



River diversion works currently under construction through west bank of river, South Saskatchewan River damsite.

Ref. No. 23165

also make possible extensive recreational development. Regulation and control of the flow of the river downstream will be possible, minimizing severe fluctuations in the level of the river, and at the same time making water available for further power and other development downstream.

Design and planning - The preparation of contract plans and specifications has been carried on by the Design Division in association with the Soil Mechanics and Materials Division. Planning for certain future phases of the work and studies of problems encountered during construction were carried out. Emphasis during 1962 was placed on the preparation of final contract plans and specifications for the tunnel control gates and hoists, tunnel stilling basins, control shaft superstructures, spillway crest and earth work on stage 4 of the embankment. Preliminary planning and design continued on the Qu'Appelle River Dam.

Construction - To date, development work on the project has been confined to the construction of the main dam across the South Saskatchewan River. The three main components of this work, which is being carried out under the direction of the





Four track-type tractors help a scraper load in mucky conditions at the South Saskatchewan River Dam.

Ref. No. 67966

P.F.R.A. engineering staff at the site, are the earth embankment, the five diversion tunnels, and the spillway.

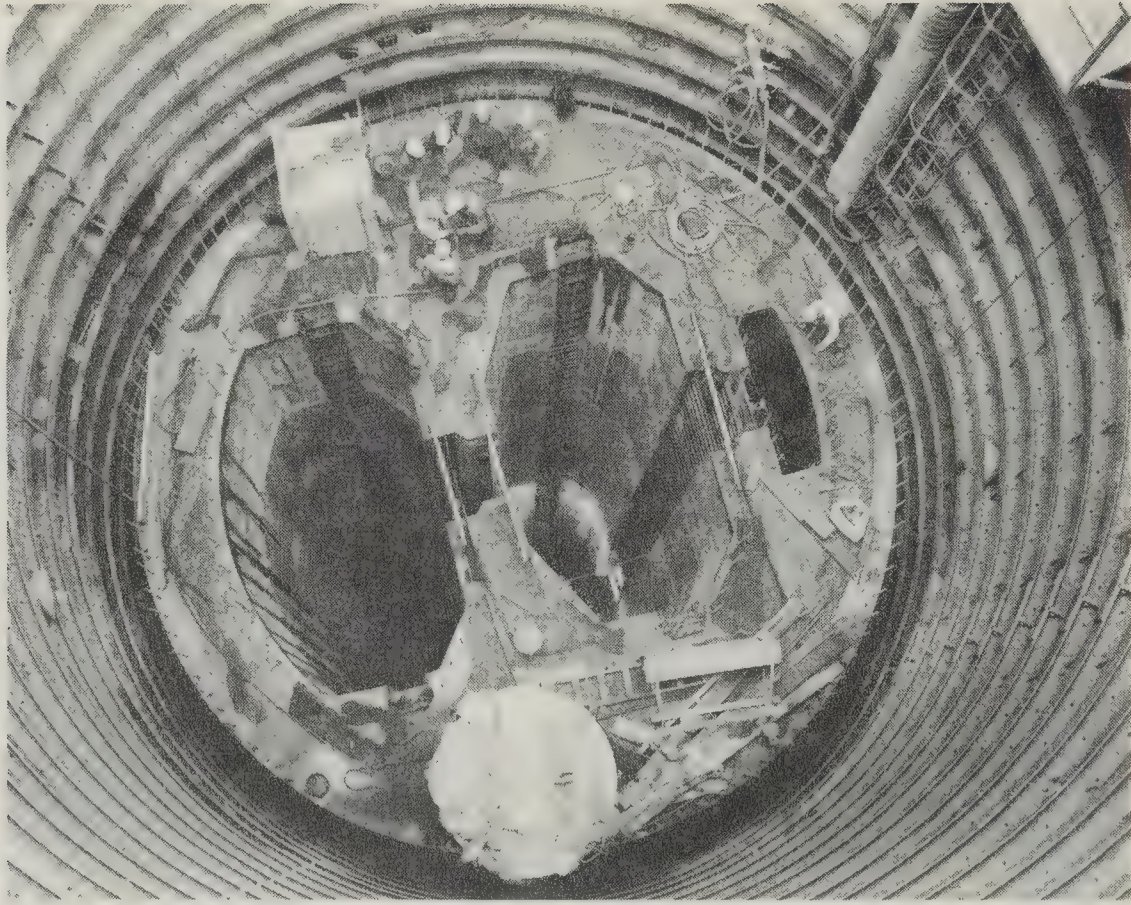
During 1962, embankment construction was confined to the stage 3 phase of the work located west of the river-diversion tunnel. This work entailed excavating and backfilling a cutoff section in the plateau area of the west abutment between the spillway structure and the control shafts, raising the embankment in the river section of the dam, and continuing construction on that section of the embankment that crosses Coteau Creek. When this contract is completed, the embankment will have been raised to its full height from the control structures to the western extremity of the dam. This contract, which also includes the main excavation for the spillway, was about 70 percent completed by the end of March, 1963.

Tunnel work progressed satisfactorily, all the mining being completed. In the upstream section, placement of the concrete lining was completed in two of the tunnels. Installation of the steel and concrete lining in the downstream section was about 90 percent finished.

The five control shafts, which extend vertically from the top of the dam to intersect the tunnels 225 feet below, were excavated before 1962. About 85 percent of the concrete lining was placed in these shafts during the year.

Also associated with the tunnels are the high-level intakes, where work went ahead satisfactorily. Other contract work in progress during 1962 included processing aggregate for tunnel and spillway construction, supplying cement, fabricating the tunnel control gates, and revising Highway 15.





The wells are to contain the regulating gates in one of the five control shafts at the South Saskatchewan River Dam.

Ref. No. 68023

The construction work force reached a peak of about 900 during the busiest months and dropped to a low of 750 during August. In addition, an average of about 200 people were steadily employed by P.F.R.A., local businesses and other operations related to the project.

To accommodate the 80,000 visitors who viewed the construction during the year, a tourist pavilion housing displays, models and photographs was maintained and manned during the warmer months of the year. A second vantage point was maintained across the river to accommodate visitors to the west side of the area. This vantage point was also staffed at appropriate times by pavilion personnel.

Family groups, mainly from Saskatchewan, made up the bulk of the visitors. However, many came in groups representing service clubs, schools, churches, agricultural and business organizations. Other visitors were tourists from various parts of Canada and the United States, as well as state officials and technical groups from Canada and other parts of the world. In response to requests, several illustrated talks were given to various organizations throughout the Province on the project's construction and development.

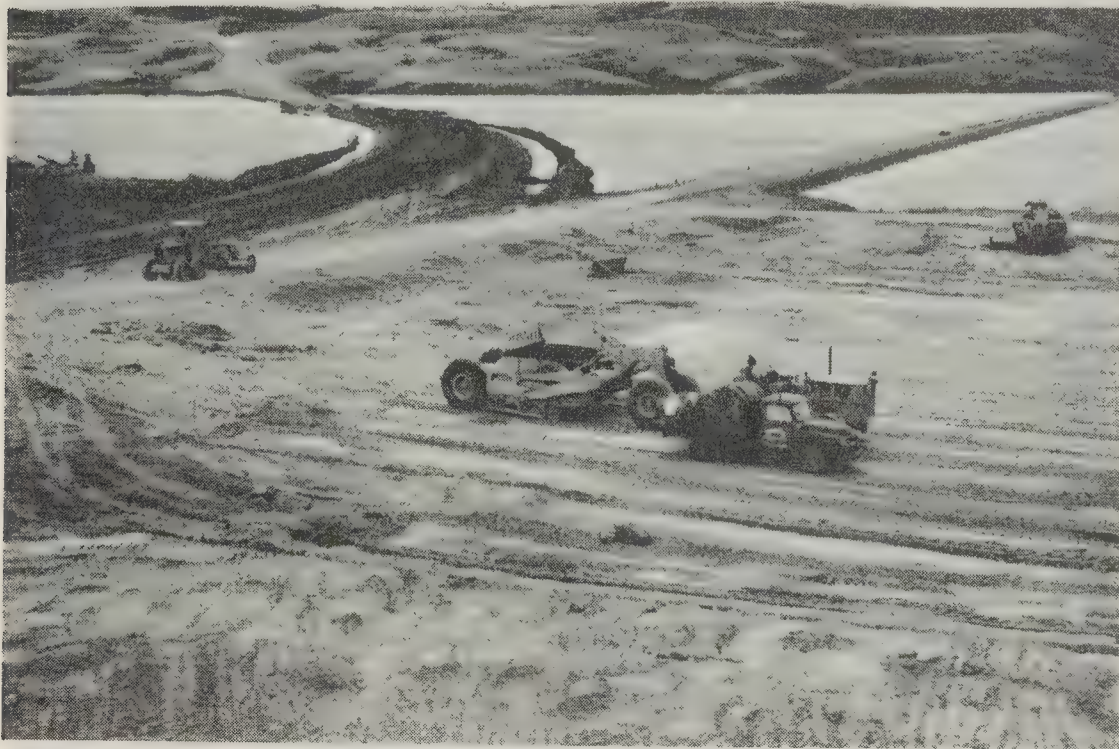
#### Regional Engineering Projects

In addition to providing engineering services for the construction and maintenance of water-development projects, the regional engineering offices are responsible for the following operations.



## Buffalo Pound Lake Water-supply Project

In accordance with a 1948 agreement between Saskatchewan and Canada, whereby Canada accepted responsibility for maintaining the level of Buffalo Pound Lake, P.F.R.A. pumped water from the South Saskatchewan River to the lake for almost four months from the end of May to the end of September, 1962. By maintaining the level of the lake, water is provided in the Qu'Appelle Valley for agricultural purposes, and for the domestic needs of the cities of Regina and Moose Jaw. When the South Saskatchewan River Dam is completed, and the reservoir has filled, it will be possible to maintain the level of the lake by gravity flow.



A new causeway, partially financed by the Federal Government, has been constructed across Buffalo Pound Lake.

Ref. No. 23566

During the four months of pump operation, 20,000 acre-feet of water reached Buffalo Pound Lake 60 miles away. Maintenance work carried out during the year consisted of cleaning about 14,000 lineal feet of the Qu'Appelle River below the Eyebrow Bridge, and construction of a timber bridge across the river for farm access.

During 1962, Canada agreed to contribute \$40,000 to the cost of constructing a new causeway across Buffalo Pound Lake. This causeway is needed because of the temporary raising of the level of the lake by 2 feet to ensure adequate water supplies in the lake for about two years. No pumping will be possible during this period when water in the South Saskatchewan reservoir will be rising, making the existing pumps inoperative.



## Assiniboine River Project

Two areas of this project were involved in construction and studies during the year. They are the Shellmouth Dam area and part of the dyked reach between Portage la Prairie and Winnipeg.

The development of a major flood-control and water-conservation reservoir on the Assiniboine River moved closer to realization with the signing of an agreement between the federal and Manitoba governments. The agreement provides for the construction of a dam near the confluence of the Assiniboine and Shell rivers, in the vicinity of Shellmouth, Man. When built, the dam will be 75 feet high and will impound 430,000 acre-feet of water in a 40-mile-long reservoir.

Various engineering departments were active during the year on this project, performing such functions as photogrammetric mapping, topographical surveying, subsurface investigations, hydrologic studies and preliminary structural designs.



Flooding along the Assiniboine River between Portage la Prairie and Winnipeg.

Ref. No. 52108-18

On the Assiniboine project, dyke construction and the protection of eroding banks made up the bulk of dyking activity along a reach of the river east from Portage la Prairie. Five miles of dyke were improved and 2 miles of banks were back-sloped and protected by P.F.R.A., using rented equipment. All freshly worked areas were cultivated, fertilized and seeded with protective grasses.



## Northwest Ecarpment and Interlake Projects

Three cooperative projects having to do with water control are in progress under the terms of agreements between the federal and Manitoba governments. These agreements spell out the division of costs and the provision of engineering services. Operation and maintenance of the projects are Manitoba's responsibility.

The three projects include the Wilson Creek Experimental Watershed on the east slopes of the Riding Mountain, the Pine River Headwater Storage Project on the eastern side of Duck Mountain and the Icelandic River Improvement Project on the Lake Winnipeg side of Manitoba's interlake area.



Runoff information on the Wilson Creek Project is tabulated at this Conway Creek weir.

Ref. No. 52113-2

Observations on stream flow, precipitation and weather continued on the Wilson Creek watershed. This work was begun in 1957 to increase knowledge of geological, biological, botanical and hydrometeorological relationships in watersheds on the Manitoba escarpment. Detention reservoirs constructed in the project are helping to reduce flooding on the lower, agricultural areas of the drainage basin.

Manitoba is providing supervision and engineering services for two control dams being built on the upper Pine River on the eastern slope of Duck Mountain. Canada's contribution to this project is mainly financial. Flood-control measures being carried out on the Pine River are part of a program of headwater storage development begun in the Duck and Porcupine Mountain areas several years ago.

Enlargement of the channel of the Icelandic River for 7 miles downstream from Arborg has been in progress for two years. Work on this project to control flooding is almost completed. Besides providing original engineering studies on this job, Canada is paying half the cost of construction.



# APPENDIX I

## WATER DEVELOPMENT PROGRAM Progress by Years in the Construction of Individual, Neighbor and Community Projects

Number of Projects Constructed				Financial Assistance Paid				
Fiscal Yr.	DO	SWD	IRR	TOTAL	DO	SWD	IRR	TOTAL
*1935-49	31,415	5,233	1,221	37,869	3,424,288.86	1,005,194.74	638,212.19	5,067,695.79
1949-50	3,031	164	123	3,318	367,392.80	214,973.66	220,242.50	802,608.96
1950-51	3,442	494	721	4,657	408,385.52	295,594.47	237,892.22	941,872.21
1951-52	478	106	350	934	60,051.14	95,488.30	171,773.19	327,312.63
1952-53	861	119	290	1,270	100,219.54	32,769.41	116,672.07	249,661.02
1953-54	1,791	190	187	2,168	227,372.12	126,415.05	209,287.59	563,074.76
1954-55	1,314	242	193	1,749	161,716.42	201,457.82	122,534.03	485,708.27
1955-56	504	159	114	777	68,141.55	78,443.87	87,547.88	234,133.30
1956-57	863	131	114	1,108	112,268.86	46,272.04	157,803.10	316,344.00
1957-58	2,218	225	155	2,598	268,273.35	143,319.23	90,787.91	502,380.49
1958-59	3,288	281	168	3,737	411,791.24	135,211.03	97,049.58	644,051.85
1959-60	3,974	259	136	4,369	820,479.90	98,981.43	70,894.59	990,355.92
1960-61	4,602	501	170	5,273	990,874.56	118,308.58	76,121.89	1,185,305.03
1961-62	9,249	297	154	9,700	2,035,757.87	108,058.79	76,374.39	2,220,191.05
1962-63	6,587	566	313	7,466	1,547,795.36	130,512.59	135,349.77	1,813,657.72
TOTAL	73,617	8,967	4,409	86,993	11,004,809.09	2,831,001.01	2,508,542.90	16,344,353.00

DO - Dugout

SWD - Stockwatering Dam

IRR - Individual Irrigation Project

\* - Annual figures for accumulated years may be found in previous reports

# APPENDIX II

## WATER DEVELOPMENT PROGRAM

Number of Individual, Neighbor, Community and Large Water Development Projects completed  
and amount of financial assistance paid from April 1, 1962 to March 31, 1963

DUGOUTS				DAMS				IRRIGATION PROJECTS				TOTALS	
Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid		
<b>MANITOBA</b>													
980	219,080.98	3	690.74	61	33,772.66	1,044	253,544.38						
9	4,634.23	-	-	9	8,122.67	18	12,756.90						
-	-	-	-	-	-	-	-						
-	-	3	242,634.00	-	-	3	242,634.00						
989	223,715.21	6	243,324.74	70	41,895.33	1,065	508,935.28						
<b>TOTAL</b>													
<b>SASKATCHEWAN</b>													
3,975	895,317.24	272	50,822.43	160	57,800.72	4,407	1,003,940.39						
33	17,852.32	-	-	6	3,651.20	39	21,503.52						
28	40,894.60	5	22,169.82	1	4,201.10	34	67,265.52						
-	-	6	348,639.00	-	-	6	348,639.00						
4,036	954,064.16	283	421,631.25	167	65,653.02	4,486	1,441,348.43						
<b>TOTAL</b>													
<b>ALBERTA</b>													
1,547	339,777.41	283	51,471.63	75	27,062.10	1,905	418,311.14						
7	4,766.98	1	1,000.00	1	739.32	9	6,506.30						
8	25,471.60	2	4,357.97	-	-	10	29,829.57						
-	-	1	45,502.00	-	-	1	45,502.00						
1,562	370,015.99	287	102,331.60	76	27,801.42	1,925	500,149.01						
<b>TOTAL</b>													
6,587	1,547,795.36	576	767,287.59	313	135,349.77	7,476	2,450,432.72						
<b>GRAND TOTAL</b>													



# APPENDIX III

## WATER DEVELOPMENT PROGRAM

Number of Individual, Neighbor, Community and Large Water Development Projects completed  
and amount of financial assistance paid from April 1, 1935 to March 31, 1963

	DUGOUTS				IRRIGATION PROJECTS				TOTALS	
	Projects Paid		Financial Assistance Paid		Projects Paid		Financial Assistance Paid			
	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid	Projects Paid	Financial Assistance Paid		
<b>MANITOBA</b>										
Individual	15,347	1,980,565.10	334	28,152.51	256	101,776.60	15,937	2,110,494.21		
Neighbor	74	19,916.86	15	4,496.20	17	10,335.29	106	34,748.35		
Community	7	12,530.86	24	131,160.47	2	30,582.54	33	174,273.87		
Large Water	-	-	27	1,690,125.82	6	617,217.00	33	2,307,342.82		
<b>TOTAL</b>	<b>15,428</b>	<b>2,013,012.82</b>	<b>400</b>	<b>1,853,935.00</b>	<b>281</b>	<b>759,911.43</b>	<b>16,109</b>	<b>4,626,859.25</b>		
<b>SASKATCHEWAN</b>										
Individual	46,254	6,674,234.44	5,148	512,086.23	2,657	671,971.01	54,059	7,858,291.68		
Neighbor	414	130,935.63	58	12,689.95	122	59,804.23	594	203,429.81		
Community	374	348,184.23	199	1,047,579.46	69	658,994.44	642	2,054,758.13		
Large Water	-	-	48	3,699,922.37	35	4,079,910.00	83	7,779,832.37		
<b>TOTAL</b>	<b>47,042</b>	<b>7,153,354.30</b>	<b>5,453</b>	<b>5,272,278.01</b>	<b>2,883</b>	<b>5,470,679.68</b>	<b>55,378</b>	<b>17,896,311.99</b>		
<b>ALBERTA</b>										
Individual	11,021	1,665,095.99	3,056	346,210.40	1,217	308,844.76	15,294	2,320,151.15		
Neighbor	51	18,861.01	15	4,960.99	16	5,773.01	82	29,595.01		
Community	75	154,484.97	118	743,664.80	53	660,461.02	246	1,558,610.79		
Large Water	-	-	6	103,597.00	18	693,004.00	24	796,601.00		
<b>TOTAL</b>	<b>11,147</b>	<b>1,838,441.97</b>	<b>3,195</b>	<b>1,198,433.19</b>	<b>1,304</b>	<b>1,668,082.79</b>	<b>15,646</b>	<b>4,704,957.95</b>		
<b>GRAND TOTAL</b>	<b>73,617</b>	<b>11,004,809.09</b>	<b>9,048</b>	<b>8,324,646.20</b>	<b>4,468</b>	<b>7,898,673.90</b>	<b>87,133</b>	<b>27,228,129.19</b>		

APPENDIX IV  
COMMUNITY WATER STORAGE AND IRRIGATION PROJECTS  
To March 31, 1963

(Community Projects costing less than \$1,000.00 are grouped under  
the heading of Small Community Projects in Appendices II and III)

MANITOBA

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Alexander Soil Conservation	Alexander	Soil Conservation	1944	-	-	5,250
Birtle Dam	Birtle	Stockwatering Dam	1947	-	-	11,490
Boissevain	Boissevain	Storage Dam	1954	-	580	29,992
Boissevain Spillway	Boissevain	Spillway	1961	-	-	20,782
Brandon Flood Irrigation	Brandon	Flood Irrigation	1949	1,000	-	27,107
Brandon Water Supply	Brandon	Storage Dam	1940	-	500	3,996
Clearwater Storage	Clearwater	Stockwatering Dam	1938	-	12	5,949
Crystal City Storage	Crystal City	Stockwatering Dam	1935	-	3	3,334
Crystal City	Crystal City	Storage Dam	1962	-	120	54,985
Dead Lake Community	Gladstone	Irrigation	1950	20	90	1,933
Deloraine Dam	Deloraine	Storage Reservoir	1962	-	1,400	154,698
Edwards, R.M. of	Melita	Stockwatering Dam	1935	-	100	10,214
Elie Dam	Elie	Stockwatering Dam	1962	-	109	34,826
Hague Dam	Sanford	Stockwatering Dam	1953	-	-	29,183
Hampson Dam	Sanford	Storage Dam	1954	-	420	16,899
Hartney	Hartney	Irrigation	1941	-	-	10,264
Killarney	Killarney	Multi-purpose Dam	1956	-	800	41,965
LaSalle River Dams	LaSalle	Stockwatering Dam	1941	-	900	22,989
LaSalle River Dam #2	LaSalle	SWD & Domestic	1961	-	260	36,531



Name of Project	Location	Type of Project	Completed	Irr. Acc.	Stor. Cap. Acre Feet	Costs
Lewko Dam	Sanford	Storage Dam	1954	-	320	20,874
Little Souris River Dam	Melita	Stockwatering Dam	1945	-	250	1,380
Mary Jane Storage Project	Manitou	Multi-purpose Dam	1959	-	1,150	96,045
McAuley Community Dam	McAuley	Stockwatering Dam	1955	-	20	2,051
Melita	Melita	Irrigation	1941	3,900	3,200	11,372
Minnedosa Dam	Minnedosa	Storage Dam	1950	20	1,500	105,051
Morden Dam (Dead Horse Creek)	Morden	Irrigation	1941	100	1,200	344,274
Morris River Dams (3)	Morris	Stockwatering Dams	1960	-	207	64,232
Morris River-Rock Lake	Carmen	Stockwatering Dam	1940	-	10,000	23,401
Napinka	Napinka	Irrigation	1941	-	-	6,770
Neepawa Storage Project	Neepawa	Multi-purpose Dam	1960	-	4,000	345,238
Oak Lake	Oak Lake	Irrigation	1956	13,000	-	119,205
Park Lake	Neepawa	Stockwatering	1953	-	-	21,626
Perry Park Dam	Westbourne	SWD & Domestic	1961	-	70	32,317
Plum Coulee	Plum Coulee	Multi-purpose Res.	1957	-	12	5,939
Plumas	Plumas	Multi-purpose Dam	1960	-	30	2,991
Plumas	Plumas	Stockwatering Dam	1961	-	14	19,096
Rivers Dam	Rivers	Multi-purpose Res.	1960	-	26,000	1,085,392
Roland	Roland	Stockwatering Dugout	1957	-	1.5	1,000
Rosebank Dam	Rosebank	Stockwatering	1948	-	32	12,161
Roseau River Dam	Dominion City	Multi-purpose Dam	1957	-	-	54,705
Shoal Lake Project	Shoal Lake	Stockwatering	1948	-	3,500	8,491
Souris Dam	Souris	Multi-purpose Dam	1952	-	150	73,597
Souris, Town of	Souris	Stockwatering Dam	1935	-	150	3,841
St. Malo Dam	St. Malo	Multi-purpose Dam	1958	-	1,770	266,937
St. Lazare Storage Reservoir	Lazare	Stockwatering	1948	-	5	1,470
Starbuck Dam	Starbuck	Stockwatering	1961	-	712	47,210
Stephenfield Dam	Stephenfield	Storage Reservoir	Incomplete	-	3,600	135,756

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Turtle Mountain Reservoir	Boissevain	Multi-purpose Res.	1956	70	600	11,968
Wawanesa	Wawanesa	Irrigation	1941	-	-	125,332
Westbourne, R.M. of	Gladstone	Stockwatering	1947	-	-	5,993
Whitemud River	Woodside	Stockwatering	1949	-	160	6,506
Whitemud River Storage	Gladstone	Stockwatering Dam	1943	-	660	11,464
SASKATCHEWAN						
Abbey	Abbey	Stockwatering Dugout	1958	-	1.5	1,000
Abound	Caron	Multi-purpose Res.	1960	-	200	5,210
Adair Creek	Wolseley	Multi-purpose Dam	1956	40	350	59,849
Adam's Lake	Battle Creek	Irrigation	1936	1,500	2,000	8,831
Admiral Storage Dam	Admiral	Irr. & Stockwatering	1949	2,000	2,200	38,520
Allan	Allan	Stockwatering	1948	-	300	4,477
Altawan	Govenlock	Irrigation	1960	1,000	5,830	261,479
Alsask	Alsask	Multi-purpose Res.	1958	-	30	9,710
Antler Creek Project	Carnduff	SWD & Domestic	1961	-	790	54,141
Arcola	Arcola	Stockwatering Dam	1939	-	(underground)	17,310
Arena	Arena	Irr. & Stockwatering	1949	1,600	3,200	5,218
Arm River, R.M. of	Davidson	Dugout	1961	-	-	1,000
Arrarat	Abbey	Stockwatering Dam	1959	-	6	7,398
Artland Grazing	Marsden	Dugout	1955	-	1.5	1,000
Avon Heights Grazing Co-op.	Shaunavon	Stockwatering	1955	-	60	2,428
Avonhurst	Qu'Appelle	Stockwatering	1956	-	1.5	3,200
Avonlea	Avonlea	Dugout	1959	-	3	2,170
Avonlea Project	Avonlea	Multi-purpose	Incomplete	-	7,000	22,532
Aylesbury	Craik	Stockwatering Dam	1961	-	40	1,265
Balcarres	Balcarres	Stockwatering	1948	-	100	7,203
Balcarres Storage	Balcarres	Stockwatering	1953	-	20	10,294
Bateman	Gravelbourg	Irr. & Stockwatering	1949	400	114	4,739
Battleford	N. Battleford	Irrigation (pump)	1941	800	-	3,058
Beadle	Eston	Dugout	1959	-	3	1,393
Beadle Project	Eston	Dugout	1960	-	-	1,393



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Beaver Creek	Hanley	Stockwatering	1951	-	200	7,998
Beechy #1	Beechy	Irr. & Stockwatering	1946	600	1,000	12,746
Beechy #2	Beechy	Irr. & Stockwatering	1948	200	100	6,240
Beechy Co-op.	Beechy	Stockwatering Dugout	1957	-	1.5	1,000
Begin Grazing Co-op. Ltd.	Albertville	Dugout	1962	-	-	1,000
Belvoir	Glamis	Dugout	1959	-	3	1,484
Bengough Agricultural Community Project	Bengough	Dugout	1960	-	-	1,000
Bengough, R.M. of	Bengough	Stockwatering Dugout	1957	-	1.5	1,000
Big Arm Storage	Liberty	Irrigation	1939	5,000	5,200	13,161
Big Stick Stockmen's Co-op. Assoc. Ltd.	Maple Creek	Dugouts (3)	1961	-	-	2,567
Birch Hills	Birch Hills	Dugout	1961	-	125	36,152
Black Hills Grazing Co-op.	Piapot	Dugout	1955	-	5	2,520
Boharm	Boharm	Stockwatering	1948	-	100	6,250
Bracken	Bracken	Stockwatering	1946	-	158	1,001
Braddock Dam	Braddock	Irrigation	1952	2,000	1,600	83,999
Brightwater Creek	Hanley	Irrigation	1956	2,500	3,500	11,713
Brightwater Lake	Dundurn	Irrigation	1960	7,000	-	12,211
Brown Hill Dam	Grenfell	Multi-purpose Dam	1958	-	275	99,394
Buffalo Pound	Qu'Appelle Valley	Irrigation	1940	x	-	83,723
Buffalo Valley	Wiseton	Dugout	1960	-	-	1,000
Burstall	Burstall	Dugout	1960	-	-	1,500
Cabri	Cabri	Stockwatering	1948	-	340	37,553
Cabri Dam (Spillway)	Cabri	Stockwatering	1960	-	340	29,107
Cadillac	Cadillac	Irrigation	1945	800	1,350	32,887
Camberly	Camberly	Irrigation & Dam	1950	-	100	2,106
Canora	Canora	Storage Dam	1941	-	300	16,128
Caron	Caron	Storage	1948	-	100	17,109
Caron Water Development	Thunder Creek	Storage Dam	1944	-	43,500	710,433
Cedoux	Cedoux	Stockwatering	1947	-	314	4,999
Ceylon Reservoir	Ceylon	Irrigation & Dam	1952	300	250	8,087
Chapleau Lake	Montmartre	Stockwatering	1949	-	3,530	8,208
Clair Creek	Wadena	Flood Irrigation	1957	100	-	1,877

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs	
Claydon	Claydon	Multi-purpose Res.	1957	-	30	2,498	
Claydon Grazing Co-op.	Claydon	DO & Stockwatering	1961	-	-	1,750	
Claydon	Claydon	Irrigation	1959	700	300	7,015	
Clearfield	Goodwater	Irrigation & Dam	1951	70	300	5,999	
Cleland Dam	Marriott	Stockwatering Dam	1961	-	210	35,949	
Colgate	Colgate	Flood Irrigation	1958	320	-	7,110	
Conquest, Village of	Conquest	Dugout	1954	-	1.5	1,000	
Congress-Stonehenge	Limerick	Stockwatering Dugout	1958	-	2	1,000	
Consul-Vidora	Vidora	Irrigation	1950	3,000	-	62,500	
Corning Dam	Corning	Stockwatering Dam	1961	-	250	8,264	
Coral	Trossachs	Stockwatering Dam	1961	-	150	7,626	
Coronach	Coronach	Irrigation & Dam	1947	300	1,450	97,807	
Craik Dam	Craik	Multi-purpose	1962	-	5,000	92,310	
Crooked & Round Lake	Qu'Appelle Valley	Irrigation	1941	x	-	48,650	
Craven Dam	Qu'Appelle Valley	Irrigation	1943	x	-	33,675	
Cypress Storage	Ravenscrag	Irrigation	1939	20,000	80,000	467,691	
Coleville, Village of	Coleville	Dugout	1958	-	1.5	1,000	
Coleville	Coleville	Dugout	1961	-	-	1,500	
Cupar	Cupar	Irrigation	1960	3,000	-	6,733	
Cupar	Cupar	Irrigation	1961	500	-	11,494	
Cupar, R.M. of	Markinch	Dugouts (4)	1961	-	-	1,650	
Dalmeny	Dalmeny	Stockwatering	1951	-	3	1,000	
Davidson	Davidson	Irrigation	1937	100	277	3,114	
Davidson Storage Project	Davidson	Multi-purpose Dam	1959	-	400	36,006	
Davin	Kronau	Stockwatering	1947	-	1,080	13,501	
Dead Lake	Macoun	Irrigation	1941	Souris River Development			17,528
Deer Forks, R.M. of #232	Burstall	Dugout	1962	-	-	1,770	
Delisle	Delisle	Stockwatering	1950	-	45	4,899	
Demaine	Demaine	Dugout	1960	-	-	1,000	
Dixson Lake	Spring Valley	Irrigation	1959	500	2,500	13,951	
Donamar	Fort Qu'Appelle	Stockwatering Dam	1961	-	60	4,485	
Doonside Dam	Wawota	Irrigation	1955	1,500	1,500	3,438	
Downey Lake	Maple Creek	Stockwatering Dam	1958	-	58	1,404	
Downey Laking Grazing Co-op.	Maple Creek	Dugout	1962	-	-	1,912	



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Dry Coulee	Eastend	Stockwatering Dam	1958	-	10	1,605
Dry Lake	Forward	Stockwatering	1949	-	600	9,729
Dunn & Watt	Mankota	Irrigation	1937	305	-	2,996
Dunning	Radville	Irrigation	1951	120	200	3,566
Dummer	Milestone	Irrigation & Dam	1949	500	200	4,742
Dodsland	Druid	Dugout	1958	-	1.5	1,000
Eagle Hill Creek	Plenty	Stockwatering	1946	-	10,700	6,432
Eagle Lake	Coleville	Irrigation & Dam	1949	2,000	3,000	5,998
Eastend	Eastend	Irrigation	1939	4,000	1,300	161,682
Eastview	Eastview	Stockwatering	1949	-	200	5,970
Eatonia	Eatonia	Stockwatering	1949	-	12	1,199
Echo Lake	Qu'Appelle Valley	Irrigation	1943	x	-	41,753
Egg Lake	Avonhurst	Multi-purpose Res.	1957	800	-	10,047
Elfros	Elfros	Stockwatering	1949	-	25	7,330
Elfros, R.M. of	Elfros	Dugouts (2)	1961	-	-	1,000
Emerald Hill	Milestone	Stockwatering	1958	-	250	7,582
Eston	Eston	Stockwatering	1954	-	10	11,469
Fahlman's Creek Project	Balgonie	Stockwatering	1949	-	400	15,599
Fairy Hill	Qu'Appelle Valley	Irrigation	1941	x	-	4,302
Fairview, R.M. of	Fairview	Dugout	1961	-	-	2,000
Fife Lake Restoration	Constance	Irrigation & Dam	1954	1,200	-	9,596
Fife Lake #2	Constance	Irrigation & Dam	1954	650	-	6,348
Fillmore	Fillmore	Stockwatering Dugout	1958	-	1.5	1,000
Fir Ridge Grazing Co-op.	Fir Ridge	Dugout	1962	-	-	1,000
Fleming	Fleming	Dugout	1960	-	-	1,000
Fleming Creek	Moosomin	Stockwatering	1950	-	75	3,282
Foam Lake (Elfros)	Foam Lake	Irrigation	1957	4,000	-	11,964
Francis Lake	Morse	Irrigation	1956	1,560	-	17,305
Frenchman Flats	Dundurn	Irrigation	1949	1,800	2,800	9,996
Frenchville	Frenchville	Irrigation & Dam	1947	430	670	8,096
Fox Valley, R.M. of	Fox Valley	Dugouts (2)	1961	-	-	1,953

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Gainsborough Dam	Gainsborough	Stockwatering	1962	-	900	88,243
Gibson Flats	Pennant	Irrigation	1953	1,200	-	14,177
Girvin	Girvin	Stockwatering Dam	1937	-	19	2,180
Glenbain, R.M. of	Glenbain	Dugout	1961	-	-	1,000
Glenside	Glenside	Stockwatering	1948	-	150	3,286
Glidden, Village of	Glidden	Dugout	1959	-	3	1,200
Gooseberry Lake	Corning	Stockwatering	1948	-	2,500	8,783
Gouverneur Dam	Ponteix	Irrigation	1952	6,000	10,000	242,468
Graham-Rogers	Qu'Appelle	Irrigation	1959	500	-	2,780
Grattle Grazing Co-op.	Hoosier	Dugout	1960	-	3	1,495
Gravelbourg South	Gravelbourg	Irrigation	1948	600	1,500	8,186
Gravelbourg Storage	Gravelbourg	Irrigation	1947	500	-	1,917
Grazing Co-op. #76	Piapot	Dugouts (4)	1961	-	-	4,800
Grosnick	Lake Alma	Stockwatering Dugout	1957	-	1.5	1,000
Gunn Grazing Co-op.	Shaunavon	Multi-purpose Res.	1957	-	10	1,632
Gunn Grazing Co-op.	Shaunavon	Stockwatering Dam	Incomplete	-	26	1,705
Gull Lake	Gull Lake	Multi-purpose Res.	1960	-	80	1,850
Hague Dugout	Hague	Stockwatering	1950	-	2	1,000
Hanley	Hanley	Stockwatering	1946	-	60	3,797
Happyland, R.M. of #231	Leader	Dugout	1962	-	-	1,824
Harris Reservoir	Maple Creek	Irrigation	1956	1,000	5,000	238,074
Haunted Hills Grazing Co-op.	Moose Jaw	Stockwatering Dam	1959	-	10	1,640
Haunted Hills Grazing Co-op.	Moose Jaw	Dugout	1961	-	-	1,101
Haunted Hills Grazing Co-op.	Moose Jaw	Dugout	1962	-	-	1,000
Hazlet	Hazlet	Multi-purpose Dam	1960	-	500	3,550
Heck Livestock Co-op. Assoc.	Prelate	Dugout	1962	-	-	3,937
Herschell Grazing Co-op.	Herschell	Stockwatering Dam	1962	-	14	3,290
Hodgeville	Hodgeville	Stockwatering	1949	-	5	2,748
Hoosier, Hamlet of	Hoosier	Dugout	1959	-	3	1,190
Hugonard Coulee Dam	Lebret	Multi-purpose Dam	1956	100	400	64,231
Jackfish Creek	Meota	Stockwatering Dam	1943	-	90	2,940
Jumping Deer Creek	Lipton	Stockwatering	1947	-	145	6,092



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Kalamazoo Grazing Co-op. #2	Mortlach	Dugout	1962	-	-	1,000
Kaposvar	Stockholm	Stockwatering	1947	-	290	11,946
Kaposvar Creek	Melville	Stockwatering Dam	1954	-	1,400	102,747
Katepwa Weir	Katepwa	Dam	1957	-	-	61,192
Kelfield	Kelfield	Stockwatering	1947	-	25	4,927
Kerrobot	Kerrobot	Multi-purpose Res.	1957	-	40	11,554
Kettlehut Reservoir	Kettlehut	Stockwatering Dam	1962	-	-	15,269
Key West, R.M. of #70	Ogema	Dugout	1962	-	-	1,000
Keyser	Cupar	Stockwatering Dam	1961	-	80	6,574
Kincaid	Kincaid	Stockwatering	1956	-	10	2,539
Kindersley, R.M. of	Kindersley	Dugout	1961	-	-	2,000
Kindersley, R.M. of	Kindersley	Stockwatering Dam	1962	-	-	6,850
Kindersley	Kindersley	Stockwatering	1949	-	300	2,007
Kisbey Flats	Kisbey	Irrigation	1939	2,300	5,000	23,211
Koch-Froh	Qu'Appelle	Multi-purpose Res.	1956	160	-	2,390
Lac Pelletier	Lac Pelletier	Stockwatering Dam	1937	-	3,350	2,139
Lacadena	Lacadena	Irrigation	1954	-	-	9,678
Lafleche	Lafleche	Stockwatering Dam	1940	-	38	2,524
Lafleche Dam	Lafleche	Multi-purpose Dam	1957	15,000	30,120	627,922
Lajord	Lajord	Dam	1936	-	300	13,800
Lake of the Rivers	Assiniboia	Stockwatering Dam	1938	-	300	10,805
Lancer Water Users	Lancer	Irrigation	1953	1,265	-	35,000
Langenburg	Langenburg	Irrigation & Dam	1949	800	200	11,752
Langenburg	Langenburg	Irrigation	1954	-	2.5	3,000
Larsen	Radville	Multi-purpose Dam	1957	-	500	36,437
Last Mountain Lake	Qu'Appelle Valley	Irrigation	1941	x	-	42,721
Lebret	Qu'Appelle Valley	Irrigation	1941	x	-	16,307
Lemsford	Lemsford	Stockwatering Dugout	1957	-	1.5	1,000
Linacre Co-op.	Fox Valley	Dugout	1960	-	-	1,100
Linacre Grazing Co-op.	Fox Valley	Dugout	1962	-	-	3,000
Lipton, R.M. of	Lipton	Dugout	Incomplete	-	-	1,099
Little Manitou Lake	Watrous	Dam	1957	-	-	39,271
Lone Tree Municipality	Climax	Dugout	1960	-	-	1,200
Lonesome Lake	Vidora	Irrigation	1949	900	800	2,771

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Long Creek #1	Estevan	Stockwatering Dam	1938	-	137	8,729
Long Creek #2	Estevan	Stockwatering Dam	1938	-	90	8,701
Longlaketon, R.M. of	Earl Grey	Dugouts (2)	1961	-	-	1,100
Longlaketon, R.M. of	Earl Grey	Dugouts (2)	1961	-	-	1,000
Loon Creek	Markinch	Stockwatering Dam	1945	-	700	7,180
Loreburn, R.M. of #354	Hawarden	Dugout	1962	-	-	1,000
Lost Forest Dam	Corning	Stockwatering	Incomplete	-	65	3,444
Lost Pine Grazing Co-op.	Paddockwood	Dugout	1962	-	-	1,000
Lucky Lake	Lucky Lake	Stockwatering	1946	-	120	7,596
McIntosh Slough	Golden Prairie	Irrigation	1949	500	1,500	1,990
McLaren Lake	Richmond	Stockwatering Dam	1962	-	3,950	5,542
Macklin Storage	Macklin	Stockwatering	Incomplete	-	40	967
Manitou Cattle Breeders Co-op.	Marsden	Dugout	1962	-	-	1,032
Mankota, R.M. of	Mankota	Dugouts (2)	1961	-	-	2,062
Maple Creek	Maple Creek	Irrigation	1938	10,000	23,260	356,179
Maple Grove	Goodwater	Dam	1959	-	330	5,988
Marcelin	Blaine Lake	Dugout	1961	-	-	1,000
March Flood Irrigation	Cedoux	Irrigation	1948	400	-	1,765
Markinch South	Markinch	Irrigation	1961	350	-	5,060
Martin Co-op.	Maple Creek	Dugout	1960	-	-	4,598
Masefield	Masefield	Stockwatering	1938	-	40	3,187
Masefield Water Users	Masefield	Multi-purpose Dam	1957	500	250	7,999
Matador	Matador	Irrigation & Dam	1946	120	220	5,216
Maymont	Maymont	Dugout	1959	-	1.5	1,200
Maxim Lake	Maxim	Stockwatering	1949	-	5,000	20,472
McCrane, R.M. of	Kenaston	Stockwatering Dam	1937	-	350	1,896
McDonald Creek	McCord	Irrigation & Dam	1950	400	90	4,992
McGurk Lake	Carlyle	Dam	1960	-	2,000	3,128
Meadowland	Macklin	Irrigation	1954	500	-	6,370
Meeting Lake	Redfield	Stockwatering	1949	-	100	2,683
Melaval	Melaval	Stockwatering	1950	-	18	1,200
Meota, R.M. of	Meota	Dugout	1953	-	1.5	1,000
Merry Flat Grazing Co-op.	Merry Flat	Dugout	1962	-	-	2,600
Middle Creek	Battle Creek	Irrigation	1937	1,000	20,000	18,663



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Mine Coulee	Neptune	Stockwatering	1948	-	40	4,377
Miry Creek, R.M. of	Abbey	Dam	Incomplete	-	20	4,680
Montague Lake	Assiniboia	Irrigation	1953	235	-	1,000
Moose Jaw Creek	Lang	Irrigation	1938	2,250	2,180	7,618
Moose Mountain	Corning	Irrigation	1937	-	8,000	14,829
Moosomin Dam (Keenan Bridge)	Moosomin	Multi-purpose Dam	1954	-	9,000	449,184
Muenster	Muenster	Irrigation	1949	25	11	2,754
Muenster	Muenster	Multi-purpose Dam	1960	-	80	8,085
Nashlyn Irrigation	Consul	Irrigation	1961	1,000	-	39,944
Neifield	Fox Valley	Dugout	1962	-	-	1,000
Neudorf	Neudorf	Multi-purpose Res.	1958	-	-	1,790
Newburn Lake	Invermay	Irrigation & Dam	1952	50	1,280	6,477
North Herbert Extension	Herbert	Irrigation	Incomplete	-	-	511,909
North Portal	North Portal	Dugout	1959	-	2	1,810
North Qu'Appelle	Fort Qu'Appelle	Stockwatering Dam	1948	-	100	2,386
Oakdale Municipality	Coleville	Dugout	Incomplete	-	-	1,020
Orkney	Orkney	Stockwatering Dam	1958	-	10	1,982
Oungre Dam	Oungre	Stockwatering Dam	1961	-	325	45,830
Oxbow Dam	Oxbow	Irrigation	1941	3,900	3,200	17,436
Pangman	Pangman	Multi-purpose Res.	1957	30	125	5,533
Pasqua	Moose Jaw	Stockwatering	1948	-	40	3,777
Piapot Band	Craven	Dugout	1962	-	-	1,900
Pike Lake	Vanscoy	Irrigation & Dam	1948	900	2,500	7,360
Pinkham Co-op.	Pinkham	Dugout	1960	-	-	1,497
Pinkham Project	Kindersley	Dugout	1960	-	-	1,000
Pinto Creek	Kincaid	Dugout	1960	-	-	1,000
Pipestone Lake	Broadview	Stockwatering Dam	1938	-	1,600	11,785
Pheasant Creek	Lemberg	Storage	1954	-	500	114,464
Poplar River	Coronach	Irrigation & Dam	1950	300	900	14,838
Portreeve	Portreeve	Stockwatering Dugout	1957	-	1.5	1,000
Primate	Primate	Stockwatering Dugout	1957	-	1.5	1,000
Prospect Valley Grazing	Linacre	Stockwatering Dugout	1962	-	-	1,622

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Prud'homme	Prud'homme	Dugout	1961	-	-	1,000
Radville	Radville	Stockwatering	1947	-	32	5,019
Reciprocity	Glen Ewen	Irrigation & Dam	1949	2,000	1,750	27,410
Redford	Wilkie	Stockwatering	1951	-	160	1,814
Redvers Dam	Redvers	Multi-purpose	1962	-	165	48,522
Richardson-McKinnon	Consul	Irrigation	1946	3,000	-	53,913
Richman Irrigation	Glen Bain	Irrigation	1949	-	1,000	4,607
Ridgeway Flats	Qu' Appelle	Multi-purpose	1957	65	80	2,054
Rinfret	Weyburn	Dugout	1959	-	6	6,997
Rockfield	Trossachs	Multi-purpose Res.	1960	-	200	6,850
Rockglen	Rockglen	Irrigation & Dam	1955	600	300	13,455
Rosedale	Hanley	Irrigation	1948	60	100	1,016
Rosthern Water Storage	Rosthern	Storage Dam	1958	-	160	22,613
Rough Bark Creek	Goodwater	Stockwatering Dam	1937	-	1,500	9,314
Round Hill Water Users	N. Battleford	Irrigation & Dam	1950	425	50	4,791
Ruddell, Village of	Ruddell	Dugout	1959	-	1.5	1,000
Russell Creek	Pambrun	Irrigation	1951	1,000	2,000	72,993
Saline	Invermay	Multi-purpose Res.	1958	1,000	-	2,377
Saltcoats	Bredenbury	Dugout	1960	-	-	1,000
Saltcoats, R.M. of	Saltcoats	Dugout	1961	-	-	1,000
Salvador	Reward	Stockwatering	1951	-	5	1,000
Saskatoon	Saskatoon	Storage Dam	1940	-	1,200	290,446
Sauder	Rush Lake	Storage & Irrigation	1949	-	800	29,115
Scotsguard	Scotsguard	Irrigation & Dam	1949	2,000	3,000	1,962
Scotsguard	Shaunavon	Stockwatering Dugout	1960	-	-	2,800
Scotsguard	Shaunavon	Stockwatering Dugout	1958	-	3	1,857
Scotsguard Grazing Co-op.	Shaunavon	Dugout	Incomplete	-	-	1,908
Shackelton, Village of	Shackelton	Dugout	1959	-	1.5	1,500
Shaheen	Rush Lake	Storage & Irrigation	1949	-	300	9,028
Shrimp Lake	Herschel	Stockwatering	1947	-	450	9,367
Sinfield	Kelvington	Multi-purpose Res.	1957	10	-	3,177
Sioux Reserve	Fort Qu'Appelle	Stockwatering	1949	-	75	8,605
Skyeta, Com.	Springside	Dam	1959	-	15	3,885



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Sliding Hills Municipality	Veregin	Dugout	1960	-	-	1,000
Smiley, Village of	Smiley	Dugout	1949	-	1.5	1,000
Smiley	Smiley	Irrigation & Dam	1951	600	300	9,998
Snake Bite	Beechy	Irrigation	1954	665	-	9,999
Snipe Lake	Eston	Stockwatering	1949	-	-	3,415
Snowdown Grazing Co-op.	Fox Valley	Dugout	1959	-	1.5	1,898
Snowdown Grazing Co-op.	Fox Valley	Dugouts (5)	1961	-	-	3,000
Souris-Estevan	Estevan	Irrigation	1941	-	-	91,133
Souris-Oxbow Weir	Oxbow	Stockwatering	1960	-	340	37,343
Souris River	Weyburn	Flood Control	1948	-	-	11,998
South Abernethy Project	Abernethy	Irrigation	1956	320	-	14,568
Spangler Project	Govenlock	Irrigation	1948	1,500	2,100	4,950
Squaw Creek Grazing Co-op.	Craik	Dugout	1961	-	-	1,000
Stelcam Community Dam	Stelcam	Stockwatering	1956	-	360	9,791
Stephens Dam	Abernethy	Stockwatering	1948	-	12	8,716
Stony Swamp Co-op. Ltd.	Meath Park	Dugout	1962	-	-	1,000
Sturgis Community Dam	Sturgis	Stockwatering	1950	-	60	20,961
Summerberry	Summerberry	Multi-purpose Res.	1956	427	-	6,824
Summercove	Mankota	Irrigation & Dam	1949	1,200	1,500	23,837
-Spillway	-	-	Incomplete	-	-	82,830
Summit Creek	Bridgeford	Irrigation & Dam	1949	800	3,000	13,227
Sunbeam Creek	Indian Head	Multi-purpose Res.	1957	100	300	5,216
Swift Current	Swift Current	Irrigation	1946	30,000	95,000	816,472
Tadmore, R.M. of Buchanan #304	Buchanan	Dugout	1962	-	-	1,000
Talmage	Cedoux	Irrigation	1948	1,600	-	3,483
Tantallon	Tantallon	Stockwatering Dam	1942	-	-	2,790
Tatagwa Lake	Weyburn	Flood Irrigation	1958	10,000	-	28,840
Terrell, R.M. of	Spring Valley	Stockwatering	1952	-	10	2,491
Terrell, R.M. of #101	Spring Valley	Dugout	1962	-	-	1,000
Theodore Dam	Theodore	Multi-purpose	Incomplete	-	11,000	20,610
Thunderchild Indian Reserve	Thunderchild	Dugout	1962	-	-	2,023
Thunder Creek	Kettlehut	Flood Irrigation	1948	-	-	27,204
Thunder Creek Channel	Moose Jaw	Irrigation & Dam	1951	300	7,000	10,007
Tilney	Tilney	Multi-purpose Res.	1958	-	100	8,308

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Torquay Dam	Torquay	Stockwatering Dam	1961	-	280	8,287
Touchwood Indian Agency	Punnichy	Dugout	1962	-	-	2,500
Tribune Dam	Fribune	Stockwatering	1950	-	300	6,499
Truax	Truax	Stockwatering	1949	-	250	11,899
Turtle River, R.M. of	Edam	Dugout	1962	-	-	1,000
Tuxford	Tuxford	Flood Irrigation	1957	800	-	7,320
Twelve Mile Lake	Maxstone	Flood Irrigation	1956	-	-	7,998
Tyvan	Tyvan	Stockwatering	1947	-	1,000	11,986
Val Marie	Val Marie	Irrigation	1937	5,920	7,000	214,558
Val Marie West (including new Spillway 1959)	Val Marie	Irrigation	1940	4,230	2,000	321,586
Valeport Dyke	Valeport	Dam	1958	1,500	-	139,748
Valley Park Irrigation	Valley Lake	Irrigation	1949	1,200	-	8,133
Vermillion Grazing Co-op.	Calderbank	Dugout	1962	-	-	1,160
Verwood	Verwood	Stockwatering Dam	1958	-	16	1,414
Weed Creek	Broadview	Flood Irrigation	1958	2,000	-	3,099
West Osage	Cedoux	Irrigation & Dam	1949	300	600	4,905
West Poplar #1	Kildeer	Multi-purpose Res.	1962	750	1,000	16,230
- Improved	-	-	-	-	-	63,836
Weyburn	Weyburn	Irrigation	1940	-	4,000	51,311
- Spillway	-	-	-	-	-	43,146
Wheatlands, R.M. of	Parkbeg	Irrigation & Dam	1951	100	60	3,452
White Gull Lake	Gull Lake	Flood Irrigation	1958	263	-	1,743
Willow Bluff Grazing Co-op.	Aylesbury	Dugouts (2)	1961	-	-	1,000
Wilson Lake	Lizard Lake	Multi-purpose Res.	1956	400	-	2,813
Wittrock	Hodgeville	Irrigation	1947	520	-	3,884
Wolseley	Wolseley	Stockwatering	1948	-	20	1,800
Wolverine Creek	Humboldt	Stockwatering Dam	1945	-	522	52,600
Wood Mountain	Willow Bunch	Irrigation & Dam	1951	40	60	6,337
Woodrow-Pinto Creek	Woodrow	Irrigation	1949	1,000	1,400	41,982
Wood River Development	Coderre and Gravelbourg	Stockwatering Dam	1942	-	4,923	33,738



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acres Feet	Costs
Wynn Community Project	Wolseley	Multi-purpose Res.	1957	500	-	3,152
Wynyard	Wynyard	Stockwatering	1947	-	35	6,225
Young	Young	Stockwatering	1948	-	250	8,892
x - Ultimate irrigation development for all projects along Qu'Appelle River Valley 30,000 - (total storage capacity - 95,600 acre feet).						
ALBERTA						
Acadia Valley	Acadia Valley	Dugout	1953	-	1.5	2,252
Acadia Valley #2	Acadia Valley	Dugout	1954	-	1.5	1,000
Aetna Irrigation District	Aetna	Irrigation	1947	8,000	-	82,004
Airdree	Calgary	Multi-purpose Res.	1958	-	200	9,789
Ambrose Flats	Irvine	Irrigation	1951	800	1,000	4,781
Anatole	Hanna	Stockwatering	1953	-	7	2,990
Antelope Park	Nemiscam	Stockwatering Dugout	1957	-	1.5	1,000
Argyle, M.D. of	Staveley	Stockwatering	1949	-	80	10,912
Atlee Gas Well #1	Atlee	Irrigation (pump)	1939	7,000	-	12,423
Atlee Gas Well #2	Atlee	Irrigation (pump)	1939	-	-	14,300
Atlee Buffalo	Atlee	Dugout	1959	-	9	7,200
Badger Lake	Lomond	Stockwatering	1948	-	10	2,990
Bain Community	Foremost	Dugout	1959	-	10.5	6,800
Balzac	Balzac	Irrigation	1956	900	-	8,141
Bare Creek	Comrey	Irrigation & Dam	1950	-	500	11,600
Bare Creek #2	Comrey	Multi-purpose Dam	1956	1,000	1,100	13,029
Bartman Dam	Cessford	Irrigation	1943	1,000	3,000	49,100
Beautyland	Bindloss	Dugout	1959	-	6	1,500
Beauvais Lake	Pincher Creek	Irrigation	1950	2,000	2,400	15,996
Beaver Dam Creek Reservoir	Castor	Stockwatering	1950	-	300	17,996
Bedford Slough	Medicine Hat	Irrigation	Incomplete	3,000	200	35,493
Bell Lake	Pollockville	Irrigation	1949	700	1,500	4,738
Berry Creek	Carolside	Irrigation	1948	10,000	30,000	158,884
- Spillway	Carolside	Irrigation	1962	-	-	45,502

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Bircham	Calgary	Flood Irrigation	1958	1,200	-	8,295
Bluefield Grazing Assoc.	Thelma	Stockwatering	1956	-	30	3,500
Blood Indian Reserve	Cardston	Dugout	1960	-	-	2,079
Blood Indian Reserve #2	Cardston	Dugouts (8)	1961	-	-	3,000
Bow Island	Bow Island	Stockwatering Dam	1958	-	1.5	1,000
Bow Slope Grazing Assoc.	Brooks	Dugouts (3)	1961	-	-	1,665
Bowell	Bowell	Dugout	1954	-	1.5	1,000
Bowmanton	Bowmanton	Stockwatering	1953	-	500	14,860
Brunswick Coulee	Enchant	Irrigation	1949	500	205	4,631
B.T. Grazing Co-op.	Hilda	Stockwatering	1956	-	3	1,000
B.T. Grazing Co-op.	Hilda	Dugout	1961	-	-	1,312
Bull Pound Creek	Hanna	Stockwatering Dam	1939	-	2,000	-
Bullshead Creek	Medicine Hat	Irrigation	1940	800	1,130	8,170
Burke Creek	Claresholm	Stockwatering Dugout	1957	-	6	4,492
Burm's Creek	Burm's	Multi-purpose Res.	1957	550	250	14,683
Cameron	Youngstown	Multi-purpose Dam	1957	662	1,000	3,905
*Canada Land & Irrig. Project	Medicine Hat	Irrigation	1936	45,000	-	80,000
Caranova	Bowell	Multi-purpose Res.	1957	500	250	8,199
Carbon	Carbon	Multi-purpose Res.	1957	300	50	8,958
Champion	Champion	Irrigation	1954	2,500	-	4,984
Chauvin Grazing Co-op.	Chauvin	Dugouts (3)	1961	-	-	1,195
Chipman Creek	Burm's	Flood Irrigation	1957	700	-	3,298
Clear Lake	High River	Stockwatering	1948	-	10,000	35,000
Collins	Sheerness	Stockwatering Res.	1956	-	40	3,495
Commodore	Vulcan	Irrigation	1954	400	-	3,990
Comrey Grazing	Comrey	Dugout	1953	-	1.5	1,000
Conrich	West Calgary	Irrigation	1954	1,600	-	6,240
Consort	Hanna	Stockwatering	1955	-	20	9,651
Coutes Community Project	Coutes	Stockwatering Dam	1959	-	15	7,743
Cowley Community	Cowley	Irrigation	1952	750	-	4,666
Craigmyle	Craigmyle	Multi-purpose Dugout	1958	-	1.5	1,000
Cressday	Medicine Hat	Stockwatering	1954	-	-	13,541
Crowfoot	Gleichen	Multi-purpose Res.	1958	-	110	3,576



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Cutbank Coulee	Cressday	Stockwatering Res.	1956	350	500	2,337
C.Y. Water Users	Taber	Stockwatering	1949	-	310	16,477
Cypress View	Irvine	Multi-purpose Res.	1958	-	300	11,336
D'Arcy	Hanna	Multi-purpose Res.	1957	-	15	2,116
Dead Fish Creek	Cessford	Irrigation	1949	4,000	5,000	47,832
Del Bonita	Twin River	Stockwatering	1955	-	250	9,196
Delia	Morrin	Stockwatering	1955	-	165	3,914
Drowning Ford	Vale	2 Dugouts & Dam	1953	-	100	4,368
Drowning Ford	Medicine Hat	Dugout	1961	-	-	1,000
East Berry Creek	Roselynn	Irrigation	1949	1,500	750	9,677
East Trout Creek	Stavely	Stockwatering Dam	1958	-	8	4,117
*Eastern Irrigation District	Brooks	Irrigation	1937	2,280	22,000	22,490
Eastern Irrigation District	Brooks	Irrigation	Incomplete	-	-	35,793
(Antelope Coulee)	Hanna	Stockwatering	1954	-	17	2,808
Esler	Macklin	Irrigation	1952	4,000	5,000	4,592
Esther Flood Irrigation	Grassy Lake	Irrigation	1949	12,000	1,000	38,568
Eureka Irrigation Project	Bow City	DO & Stockwatering	1961	-	-	1,300
Eyemore Grazing Assoc.	Stettler	Stockwatering Dam	1959	-	35	1,400
Fenn	Pincher Creek	Irrigation & Dam	1954	1,000	-	6,895
Fish Lake	Retlaw	Stockwatering	1948	-	1,500	20,125
Franklin Coulee	Sponden	Stockwatering Dugout	1956	-	6	1,596
Garden Plains	Gem	Dugout	1962	-	-	1,000
Gem Grazing Assoc.	Calgary	Stockwatering Dam	1943	-	230	8,529
Graham Creek	Three Hills	Multi-purpose Res.	1956	30	117	9,482
Grainger	Granlea	Stockwatering Dam	1959	-	725	12,853
Granlea Community	Manyberries	Irrigation & Dam	1954	500	650	9,798
Greasewood Coulee	Halkirk	Irrigation	Incomplete	303	-	2,637
Halkirk Com.	Youngstown	Multi-purpose Res.	1957	2,000	401	8,000
Hampton	Hanna	Stockwatering	1948	-	500	29,498

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Hays	Hays	Dugout	1960	-	-	4,500
Heath Creek	Northfork	Stockwatering Dam	1958	-	12	4,095
Hilda Community Project	Hilda	Multi-purpose Dugout	1957	-	10	5,180
Huber Dam	Castor	Stockwatering Dam	1959	-	112	3,068
Illingsworth	Bow Island	Dugout	1954	-	1.5	1,000
Indian Farm Creek	Pincher Creek	Irrigation & Dam	1953	600	500	4,795
Indus Community Project	Conrich	Irrigation	1955	1,220	-	9,843
Irvine	Irvine	Irrigation & Dam	1950	70	100	4,799
Irvine	Irvine	Multi-purpose Res.	1960	-	15	4,714
Jaydot	Elkwater	Multi-purpose Res.	1956	300	400	8,988
Kathryn	Calgary	Irrigation & Dam	1954	300	-	9,184
Lake Valley	Bowell	Stockwatering Dugout	1957	-	1.5	1,000
Langford Riley Stock Assoc.	Nanton	Dugout	1962	-	-	1,000
*Leavitt Irrigation	Mountain View	Irrigation	1939	7,000	7,050	65,578
Lewis	Vulcan	Irrigation & Dam	1953	350	-	4,345
Lochend Lake	Calgary	Dam & Irrigation	1958	1,600	1,100	7,750
Lomond	Lomond	Dugout	1959	-	3	1,000
Lomond Grazing Assoc.	Lomond	Dugouts (5)	1961	-	-	2,500
Loveland	Hanna	Irrigation	1954	3,000	-	17,655
Loyalist Creek	Hanna	Irrigation	1950	2,000	1,400	14,993
Lundbreck	Pincher Creek	Stockwatering	1953	-	100	4,689
McAlpine Reservoir	Walsh	Irrigation	1951	600	1,000	15,917
McArthur	Walsh	Dam	1959	-	700	14,565
McGregor Dam	Vulcan	Irrigation	1951	1,500	700	9,473
McLaren	Michichi	Multi-purpose Res.	1957	150	660	13,815
Mackay Dam	Walsh	Irrigation	1952	600	300	9,600
*Magrath	Magrath	Irrigation	1939	4,000	-	2,756
Many Islands Grazing Assoc.	Walsh	Dugout	1962	-	-	2,171
Meadow Creek Dam	Claresholm	Irrigation	1952	1,500	-	5,630
Medicine Lodge Stock Assoc.	Medicine Hat	Stockwatering Dam	1961	-	-	1,372



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Mekastoe	Fort MacLeod	Dam	1959	-	210	4,594
Michelle Creek Project	Thelma	Multi-purpose Res.	1959	-	800	14,791
Michichi	Morrin	Stockwatering Dam	1961	-	450	4,629
Milk River	Milk River	Dugout	1960	-	-	4,448
Milk River Co-op. Grazing Assoc.	Milk River	Dugouts (4)	1961	-	-	3,908
Milne Community Project	Conrich	Irrigation	1955	1,300	-	9,644
Mountain View	Mountain View	Storage Dam	1936	-	4,200	3,000
Naismith	Youngstown	Multi-purpose Res.	1956	300	145	9,421
Nemiscam	Etzikom	Dugout	1954	-	1.5	1,000
Nemiscam Community Pasture	Foremost	Dugout	1962	-	-	1,500
Nester	Cessford	Multi-purpose Res.	1957	300	1,350	8,670
New Brigden	Hanna	Stockwatering Dam	1958	-	60	3,582
Newell Cattle Grazing Assoc.	Brooks	Dugouts (5)	1961	-	-	2,635
Nobleford Water Users	Nobleford	Dugouts (2)	1953	-	3	11,173
North Fincastle	Taber	Irrigation & Dam	1948	2,000	4,000	17,943
Osburne Water Conservation	Ildesleigh	Dam	1959	-	210	9,495
Oyen	Oyen	Stockwatering Dugout	1957	-	1.5	1,000
Parfles	Chancellor	Irrigation	1954	250	-	4,730
Parr Reservoir	Castor	Multi-purpose Dam	1961	-	-	31,463
Patricia Grazing Co-op.	Patricia	Dugout & SWD	1961	-	-	3,363
Peace Butte Reservoir	Peace Butte	Stockwatering	1955	450	550	8,993
Peigan Indian Reserve	Brocket	Dugouts (6)	1961	-	-	4,800
Pershing Dam	Glenwood	Irrigation	1951	100	200	4,782
Pinhorn Grazing Assoc.	Orion	Dugout	1962	-	-	7,536
Pirmez Creek	Pirmez Creek	Irrigation	1951	6,000	500	20,998
Porcupine Hills	Fort MacLeod	Dugout	1959	-	1.5	4,599
Porcupine Hills Stock Assoc.	Fort MacLeod	Dugout	1960	-	-	1,868
Pothole Coulee	Magrath	Irrigation	1948	Part of St. Mary Project	-	8,802
Priddis	High River	Stockwatering	1955	-	312	4,812
Provost, Village of	Provost	Multi-purpose Dam	1956	-	3	

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Ranchville Community Res.	Ranchville	Irrigation	1957	300	—	4,950
*Raymond	Raymond	Irrigation	1943	3,000	1,600	6,000
Reid Hill	Vulcan	Irrigation	1952	1,000	700	8,866
Remount	Bindloss	Dugout	1960	—	—	3,000
Rock Creek Stock Assoc.	Sandbreck	Stockwatering Dugout	Incomplete	—	—	1,819
Rock Creek Stock Assoc.	Lundbreck	DO & Stockwatering	1961	—	—	3,030
Rock Lake Project	Brooks	Irrigation	1957	11,000	—	133,984
*Rolling Hills	Rolling Hills	Irrigation	1938	25,000	—	46,839
Rose Glen Water Users	Schuler	Multi-purpose Dam	1957	200	150	6,884
Ross Creek	Irvine	Irrigation	1950	3,000	5,000	47,998
Ross Lake Com. Pasture Assoc.	Cardston	Dugouts (4)	1961	—	—	2,160
Ross Lake Community	Raymond	Stockwatering	1950	—	300	7,987
Rough Meadow Reservoir	Coronation	Irrigation	1951	200	—	2,471
Ruks	Pincher Creek	Irrigation & Dam	1954	900	250	6,484
Sandy Lake Project	Pincher Creek	Stockwatering Dam	Incomplete	—	678	2,261
Sarcee Indian Band						
Reserve #145	Calgary	Dugouts (2)	1961	—	—	1,575
Schuler Waters Users	Schuler	Multi-purpose Res.	1957	—	5	5,443
Serviceberry Creek	near Drumheller	Irrigation	1949	1,200	500	17,518
Seven Persons	Seven Persons	Stockwatering Dam	1943	—	800	12,103
Severn Creek	Rosebud	Irrigation & Dam	1950	1,000	1,000	24,990
Sheerness Grazing (Blois)	Roselynn	Stockwatering	1953	—	12	3,797
Sheerness #2	Roselynn	Stockwatering	1954	—	50	2,190
Snake Creek	Calgary	Irrigation & Dam	1950	500	300	15,976
Sounding Creek	Cereal	Irrigation	1949	8,000	5,600	51,988
South MacLeod	MacLeod	Irrigation	1948	6,000	—	82,614
Spondin	Hanna	Dugout	1955	—	1.5	1,000
Spruce Coulee	Elkwater	Stockwatering Dam	1959	—	1,000	12,496
Spruce Co-op.	Parkland	Stockwatering Dugout	1960	—	—	3,529
Spruce Ranching Co-op.	Parkland	Dugout	1962	—	—	2,488
Squaw Coulee	High River	Irrigation	1949	2,000	455	17,999
Starland, M.D. of	Morrin	Stockwatering	1956	—	45	3,196
Stehr Coulee	Walsh	Multi-purpose Res.	1956	—	26	4,570
Sterling Pasture Co-op. Ltd.	Sterling	Dugout	1961	—	—	1,000



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
Stony Indian Reserve	Calgary	Dugout	Incomplete	-	-	1,404
Sundial	Champion	Dugout	1959	-	6	3,102
Sundial	Champion	Dugout	1961	-	-	3,650
Swalwell	Swalwell	Multi-purpose Res.	1957	280	300	9,463
Three Hills	Three Hills	Stockwatering	1948	-	120	19,652
Tilley Rolling Hills Grazing	Tilley	Dugout	1962	-	-	4,900
Twin Lakes	Chancellor	Irrigation	1954	500	-	12,498
Twin River Grazing	Twin River	Stockwatering	1953	-	125	4,486
Twin River Grazing Assoc.	Milk River	Dugouts (8)	1961	-	-	4,726
Two Lakes	Elkwater	Multi-purpose Res.	1958	1,500	1,900	14,378
Vauxhall	Vauxhall	Stockwatering	1948	-	30	5,883
Vulcan Dam	Vulcan	Irrigation	1951	400	150	3,997
Waddington	Vale	Multi-purpose Res.	1957	-	12	2,904
Walsh Flats	Walsh	Irrigation	1953	2,100	25,000	4,700
Watson Coulee Grazing	Consort	Stockwatering Dam	1962	-	50	1,200
Watts Flats	Watts	Flood Irrigation	1958	2,000	-	6,147
(Bull Pound-Lone Butte)	Claresholm	Dugout	1960	-	-	2,263
West Trout Creek	Rockyford	Irrigation	1952	-	-	4,744
Wheatacre #2	Rockyford	Irrigation	1950	1,600	1,500	12,976
Wheatacre Dam	Cressday	Irrigation	1936	3,600	4,500	24,370
Wild Horse Storage	Hussar	Irrigation	1950	1,000	500	9,993
Wintering Hills	Medicine Hat	Multi-purpose Res.	1957	420	500	14,403
Wisdom Waters Users	Cardston	Irrigation	1955	400	-	3,593
Woolford Community Project	Milk River	Dugout	1959	-	6	8,291
Writing on Stone						
Yeast Reservoir	Thelma	Irrigation	1953	400	800	6,592

\* - P.F.R.A. gave assistance to a project already in existence to improve storage capacities, canals and distribution systems.

APPENDIX V  
CUMULATIVE STATEMENT  
Development and Operation of Community Pastures under the  
Prairie Farm Rehabilitation Act  
1938 to March 31, 1963

Fiscal Year	No. of Pasture Units in Operation	Area of Land in Pastures (acres)	Total Cost of Construction of Pastures \$	Livestock Units Carried on Pastures	X Acres per Unit of Live-stock	Cost of Operation Revenue \$	Operating Costs \$	Net Operating cost per Unit of Livestock \$	Average Charge per Unit Livestock to Farmers \$
1938-39	14	189,800	165,995.03	3,231	58.7	6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1	21,632.71	20,945.84	1.82	1.88
1940-41	35	884,500	1,004,305.91	23,245	38.1	43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2	65,434.89	50,607.22	1.52	1.97
1942-43	45	1,261,100	1,129,487.54	51,127	24.7	98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3	111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,699,012.21	59,997	22.3	151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1	167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6	198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4	203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1	204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5	211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1	221,129.45	217,867.15	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4	335,327.16	237,742.13	3.08	4.34
1952-53	59	1,652,020	3,754,098.41	94,137	17.5	438,513.75	373,737.36	3.97	4.66
1953-54	60	1,678,736	3,963,572.83	109,583	15.3	507,179.14	490,807.89	4.48	4.55
1954-55	60	1,696,900	4,273,916.79	106,322	15.9	496,805.78	466,153.69	4.38	4.66
1955-56	60	1,728,700	4,509,668.59	108,499	15.8	499,045.13	501,540.73	4.67	4.60
1956-57	61	1,759,570	4,832,863.47	117,441	14.9	548,601.01	508,002.83	4.33	4.67
1957-58	61	1,796,275	5,119,317.01	119,398	15.0	552,938.40	607,129.23	5.08	4.63
1958-59	62	1,815,265	5,509,958.43	117,032	15.5	542,606.90	686,448.88	5.87	4.64
1959-60	64	1,818,464	5,800,342.43	124,812	14.6	705,785.32	742,915.21	5.95	5.65
1960-61	65	1,896,173	6,254,224.42	122,813	15.4	656,708.97	879,811.85	7.15	5.35
1961-62	68	2,088,704	6,845,655.79	146,672	14.2	860,808.25	1,128,255.75	7.69	5.87
1962-63	71	2,114,412	7,283,657.67	139,643	15.1	871,955.43	1,044,241.41	7.48	6.24
						<u>8,719,816.59</u>	<u>9,097,442.23</u>		

x — A livestock unit indicates one head of cattle, one horse, or five sheep.

A pasture unit may include one or more pastures, but it is operated under one management.



# APPENDIX VI

## P.F.R.A. COMMUNITY PASTURES IN OPERATION DURING THE FISCAL YEAR ENDED MARCH 31, 1963

Community Pasture & Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1962	Accumulated Cost of Construction March 31, 1963	1962-1963		
				Cattle	Horses	Sheep
Pasture Units - Saskatchewan						
Antelope Park #322, Hoosier	34,640	112,978.89	114,673.64	1,456	21	
Auvergne-Wise Creek #76-77, Cadillac	42,880	149,511.56	153,456.96	3,038	-	
Battle Creek #20, Divide	69,920	169,949.49	177,840.47	2,577	-	
Battle River-Cutknife #438-9, Gallivan	31,680	99,932.39	102,727.39	1,768	22	
Beaver Hills #245-6, Parkerview	44,160	157,100.31	167,173.05	4,283	102	
Big Stick #141, Maple Creek	22,260	48,320.53	50,925.53	1,497	-	
Bitter Lake #142, Maple Creek	43,870	130,213.93	132,765.64	2,218	-	
Brokenshell #68, Pasture #1, Yellow Grass	22,720	112,282.91	114,963.20	1,953	31	
Brokenshell #68, Pasture #2, Weyburn	8,160	16,730.80	16,730.80	397	1	
Caledonia-Elms Thorpe #99-100, Milestone	26,400	121,804.41	121,804.41	2,087	35	
Coalfields #4, North Portal	32,860	172,736.76	177,145.42	3,902	39	2,040
Cote #271, Togo	9,920	79,890.71	82,889.46	625	-	
Coteau #255, Birsay	27,520	67,795.84	68,907.50	1,753	13	
Dundurn #314, Dundurn	44,840	118,528.25	122,247.37	2,161	-	504
Eagle Lake #289-319, Netherhill	23,729	105,168.41	114,709.26	905	-	
Elbow #223-4, Elbow	30,080	84,839.03	98,655.85	2,266	26	
Estevan-Cambria #5-6, Macoun	6,720	21,191.07	21,191.07	508	-	
Excel #71, Ormiston	20,500	80,993.88	83,913.68	1,552	-	
Fairview #258, Elrose	17,000	126,181.09	129,871.64	1,171	-	
Govenlock #22, Govenlock	68,800	118,191.72	128,533.49	1,666	-	
Gull Lake #139, Tompkins	10,720	34,992.31	36,351.99	639	-	
Heart's Hill #352, Compeer, Alta.	15,520	64,988.96	67,074.71	1,550	-	
Hillsburg #289, Brock	13,600	57,625.39	57,990.33	845	-	
Key West #70, Kayville	10,240	38,641.58	44,713.04	707	2	
Kindersley-Elma #290-1, Smiley	21,400	123,324.68	125,887.90	1,120	6	
Laurier #38, Lomond #37 - #2, Radville	37,175	117,361.14	122,922.06	3,490	30	
Lomond Pasture #37, Pasture #1, Goodwater	23,360	92,010.85	100,606.69	2,710	48	
Lomond #37, Pasture #3, Maxim	18,400	93,533.58	93,903.08	1,827	9	

Community Pasture & Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1962	Accumulated Cost of Construction March 31, 1963	1962-1963 Stock Pastured		
				Cattle	Horses	Sheep
Pasture Units - Saskatchewan (cont'd)						
Lone Tree #18, Bracken	33,600	107,216.97	110,608.60	1,494	-	-
McCraney #282, Davidson	10,720	70,021.52	70,021.52	1,623	-	-
Mantario #262, Empress, Alta.	24,960	83,767.24	84,396.74	1,769	-	-
Mariposa #350, Kerrobert	26,880	103,096.08	110,161.20	1,639	-	-
Masefield #17, Orkney	36,800	120,697.63	129,260.55	1,745	-	-
Monet #257, Elrose	46,840	124,133.00	124,133.00	3,221	28	-
Montrose #315, Donavon	21,920	85,657.27	89,576.19	1,007	-	-
Mt. Hope-Prairie Rose #279-309, Semans	32,180	112,957.41	115,305.41	2,617	-	-
Nashlyn, #21, Consul	61,520	97,211.43	100,278.40	2,251	5	40
Newcombe #260, Glidden	52,960	195,010.30	196,835.19	2,799	21	-
Oakdale #320, Beaufield	20,800	98,607.41	100,343.96	1,445	-	-
Park #375, Langham	7,040	22,633.89	24,242.89	474	-	-
Paynton #470, Paynton	24,480	90,641.54	92,604.26	2,027	15	-
Progress #351, Kerrobert	20,000	74,551.62	82,118.97	1,494	-	-
Reno #51, Pasture #1, Robsart	17,120	64,633.54	66,232.45	974	4	-
Reno #51, Pasture #2, Consul	11,360	29,877.83	29,877.83	772	-	-
Royal #465, Leask	65,120	237,816.18	254,936.45	5,223	-	-
Rudy-Rosedale #284-3, Broderick	19,200	90,880.19	92,194.44	1,757	51	-
Shamrock #134, Shamrock	26,080	87,147.26	87,497.26	1,584	-	-
Spy Hill #152, Welby (operated in conjunction with Ellice, Man.)	19,570	58,871.71	60,342.62	799	7	-
Swift Current-Webb #137-8, Swift Current	19,200	98,849.80	99,764.80	1,663	-	-
Tecumseh #65, Forget	18,880	95,510.49	99,478.86	2,056	8	-
The Gap #39, Ceylon	13,920	91,335.44	92,312.96	1,230	22	-
Usborne #310, Venn	12,680	60,703.25	62,547.52	1,370	-	-
Valeport	908	-	6,288.20	543	-	-
Val Marie #47, Pasture #1, Val Marie	110,000	280,550.38	289,369.04	3,831	-	-
Val Marie-Beaver Valley #2, Admiral	57,680	60,686.85	64,127.90	2,962	-	-
Wellington #97, Tyvan	25,360	125,554.55	130,020.37	3,218	43	-
Willner #253, Davidson	13,280	86,368.38	87,759.54	1,898	9	-
Wolverine #340, Plunkett	17,280	83,276.31	83,445.53	1,883	-	-



Community Pasture & Headquarters	Total Area of Pasture Fenced (Acres)	Accumulated Cost of Construction March 31, 1962	Accumulated Cost of Construction March 31, 1963	1962-1963 Stock Pastured		
				Cattle	Horses	Sheep
Pasture Units — Saskatchewan (cont'd)						
Wreford #280, Nokomis	13,870	83,615.95	85,313.94	1,127	—	
Total for Saskatchewan	1,661,282	5,738,701.89	5,951,972.22	109,166	598	2,584
Special Project — Bitter Lake Irrigation acreage included in Bitter Lake Pasture.						
Pasture Units — Manitoba						
Archie, Welwyn, Sask.	39,740	99,482.17	102,944.27	1,630	11	1,050
Dauphin-Ethelbert, Ukraina	23,400	120,014.99	126,851.00	1,488	8	
Ellice, Welby, Sask. (operated in conjunction with Spy Hill #152)	20,320	28,998.21	30,469.12	799	7	
Gardenton, Gardenton	12,560	—	74,944.83	865	—	
Lakeview, Langruth	29,280	84,820.82	84,820.82	2,921	26	
Langford, Neepawa	20,000	77,559.36	80,557.08	1,652	27	
McCreary, McCreary	71,820	244,935.46	258,934.98	3,433	15	
Portage, Poplar Point	14,640	48,923.97	49,675.57	2,410	25	
San Clara	8,320	34,608.03	37,606.78	626	—	
Turtle Mountain, Boissevain	23,870	143,750.19	146,399.91	1,642	14	
Wallace, Virden	10,240	—	65,207.98	741	—	
Wallace, Elkhorn	3,280	(Operated by the R.M. of Wallace)				
Westbourne, Gladstone	12,700	57,664.63	58,592.00	1,784	28	
Woodlands, Poplar Point	20,960	75,389.92	85,961.01	3,183	29	
Total for Manitoba	311,130	1,016,147.75	1,202,965.35	23,174	190	1,050
Pasture Units — Alberta						
Suffield, Medicine Hat	145,280	90,806.15	128,720.10	5,788	—	
Total for Alberta	145,280	90,806.15	128,720.10	5,788	—	
GRAND TOTALS	2,117,692	6,845,655.79	7,283,657.67	138,128	788	3,634

APPENDIX VII  
MAJOR PROJECTS – IRRIGATION, RECLAMATION AND WATER STORAGE  
(Projects by Special Votes of Parliament, Administered by P.F.R.A.)  
to March 31, 1963

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
MANITOBA						
Assiniboine River Diking & Cut Off	Brandon	River Control	Incomplete	—	—	1,276,134
North-West Escarpment Reclamation Proj. — Riding Mt. Area	Dauphin	Watershed Control	Incomplete	—	—	1,154,308
Fairford River Project	Lake Manitoba	Flood Control	1960	—	—	287,751
Saskatchewan River Reclamation — Pasquia Area	The Pas	Reclamation	Incomplete	135,000	—	2,256,388
ALBERTA						
Bow River	Medicine Hat	Irrigation	Incomplete	235,000	408,862	54,398
(a) Purchase of Canada Land & Irrigation Company						2,353,182
(b) Development & Construction						21,501,504
St. Mary	Lethbridge	Irrigation	Incomplete	510,000	320,000	18,886,519
Belly River Diversion	Lethbridge	Irrigation	1950	—	—	53,901
BRITISH COLUMBIA						
Cawston Benches	Keremeos	Irrigation (pump)	1951	629	2,000	185,491
Chase & Johnston — Western Canada Ranching	Kamloops	Irrigation	1951	755	—	98,243
Western Canada Ranching #2	Kamloops	Irrigation (pump)	1950	54	—	58,069
Lillooet — Pemberton	Pemberton	River Control	1953	—	—	1,056,539
South Thompson — Niskolith						
Gravity Project	Kamloops	Irrigation	Incomplete	1,030	1,200	12,282
Westbank Project	Kelowna	Irrigation	1950	1,200	2,500	537,450
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	—	32,229
Penticton West Bench	Penticton	Irrigation (pump)	1953	800	—	66,362
B.C. Fruitlands	Kamloops	Irrigation	Incomplete	2,000	—	200,000

(Above includes ONLY Construction Costs)



Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
SASKATCHEWAN						
South Saskatchewan River Project	Outlook	Multi-purpose	Incomplete	500,000 (Including 24,000 in Qu'Appelle extension)	-	49,548,901
Buffalo Pound Project	Qu'Appelle Valley	Urban Water Supply	1960	-	42,000	2,194,908
- Eyebrow Lake Diversion	Eyebrow	Water Supply	1960	-	-	98,376
(Above includes ONLY Construction Costs)						

APPENDIX VIII  
PFRA EXPENDITURES BY ACTIVITIES  
April 1, 1935 to March 31, 1963

ADMINISTRATION

Ottawa and Regina Administration	\$ 2,985,930
Engineering Services – Surveys, Design, Soil Mechanics, Drainage Studies, Legal Surveys, Supervision of Construction	22,562,110

LAND UTILIZATION

Cultural work – Soil Drifting, etc. (Exp. Farm Service)	4,966,394
Community Pastures – Construction, Operation and Maintenance Movement of Settlers	23,267,614 227,841

WATER DEVELOPMENT

Small Farm Projects	25,279,114
Community, Large Water Storage and Irrigation Projects Supervision	20,128,769 4,112,138
Equipment – Purchase and Repairs, Service Depot	8,803,779

MAJOR PROJECTS: IRRIGATION, RECLAMATION AND CONSERVATION

St. Mary Irrigation Project	26,713,427
Bow River Irrigation Project	31,734,200
South Saskatchewan River Project	59,010,362
Assiniboine River Dyking	1,439,264
B.C. Reclamation and Development, incl. Lillooet Project	3,310,182
Land Protection and Reclamation, Manitoba and Eastern Canada	3,977,226
Miscellaneous Projects – Construction	4,359,843
	<u>\$242,878,193</u>

REVENUE:

Community Pasture Operations	\$ 9,328,291
Irrigation Project Operation and General Revenue	4,738,830
	<u>\$14,067,121</u>









Gov. Doc  
Can  
Ag

CAI DA 20  
- A 56



# Annual Report

Prairie farm rehabilitation  
and related activities

1963  
1964

CANADA DEPARTMENT OF AGRICULTURE

Department of Prairie Farm Rehabilitation Branch





ANNUAL REPORT  
ON PRAIRIE FARM REHABILITATION  
AND RELATED ACTIVITIES  
1963 - 1964





# CONTENTS

INTRODUCTION .....	Page
ORGANIZATION .....	
ADMINISTRATION DIVISION .....	1
Personnel .....	1
Finance .....	1
Office Services .....	1
Purchasing .....	1
Information .....	1
Land .....	2
WATER DEVELOPMENT SERVICE .....	3
Field Services .....	3
Dugout Pumping .....	3
Emergency Community Well Drilling .....	3
Large Water Storage Projects .....	3
Conjuring Creek .....	3
Stephenfield Dam .....	4
Mossy Dam .....	4
Theodore Dam .....	4
Avonlea Creek Storage .....	4
Summercove Dam .....	4
Welwyn Dam .....	4
Carolside Dam .....	4
Irrigation Projects .....	4
Rehabilitation, Southwest Saskatchewan .....	4
Bow River .....	5
Agricultural Operations .....	5
Settlement .....	5
Irrigation Demonstration Farm .....	5
Project Maintenance and Construction .....	6
Tree Nursery Stations .....	6
LAND USE SERVICE .....	7
Pasture Operations .....	7
Grazing Allocation and Fees .....	7
Hay and Feed Grain .....	7
Insurance .....	8
Livestock Diseases .....	8
Breeding Service .....	8
Construction and Improvement .....	8

# CONTENTS (continued)

	Page
<b>ENGINEERING SERVICE .....</b>	<b>10</b>
Design Division .....	10
Hydraulic Laboratory .....	10
Air Photo Analysis and Engineering Geology Division .....	10
Soil Mechanics and Materials Division .....	11
Hydrology Division .....	11
Surveys Division .....	11
Regional Offices .....	12
Assiniboine River .....	12
Northwest Escarpment and Interlake .....	12
Peguis and Fisher River Indian Reserves Flood Control .....	13
Pembina-Winkler Storage and Irrigation .....	13
Buffalo Pound Water Supply .....	13
British Columbia Project Investigations .....	13
Alberta Project Investigations .....	13
Blood Indian Creek .....	13
Hanna .....	13
Sage Creek .....	14
Western Irrigation District .....	14
Chain Lakes .....	14
Pincher Creek .....	14
Three Rivers .....	14
Paddle River .....	14
Major Projects .....	14
St. Mary Irrigation .....	14
Engineering and Construction .....	14
Improvement and Maintenance .....	15
Operation .....	15
South Saskatchewan River .....	15
Design and Planning .....	15
Construction .....	15
 <b>APPENDICES .....</b>	
Water Development Projects Completed and Assistance Paid, 1935-64 .....	16
Development and Operation of Community Pastures under PFRA, 1938-64 .....	17
Major Projects - Irrigation, Reclamation and Water Storage to March 31, 1964 .....	18
PFRA Expenditures by Activities, 1935-64 .....	20



## INTRODUCTION

The Prairie Farm Rehabilitation Act was passed by Parliament in 1935 to provide for the rehabilitation of drought and soil-drifting areas of Manitoba, Saskatchewan and Alberta. It was amended in 1937 to include land utilization and resettlement, and again in 1939 to extend it indefinitely.

Originally, the Act provided assistance for conserving and reclaiming land and water resources throughout the southern plains area of the Prairie Provinces. This has been done mostly by establishing community pastures on land unsuited to cereal crops and by conserving runoff water through the construction of dugouts or by damming prairie streams. More recently, the program has been extended to the whole of the settled agricultural area of the Prairie Provinces. In addition, PFRA has been made responsible for developing large-scale irrigation and reclamation projects for the federal government, and since the passing of the Agricultural Rehabilitation and Development Act in 1961, has been increasingly active in initiating this program in the four Western provinces. As well, on April 1, 1963, PFRA took over the tree nurseries at Indian Head and Sutherland, Sask., previously under the Research Branch of the Canada Department of Agriculture.

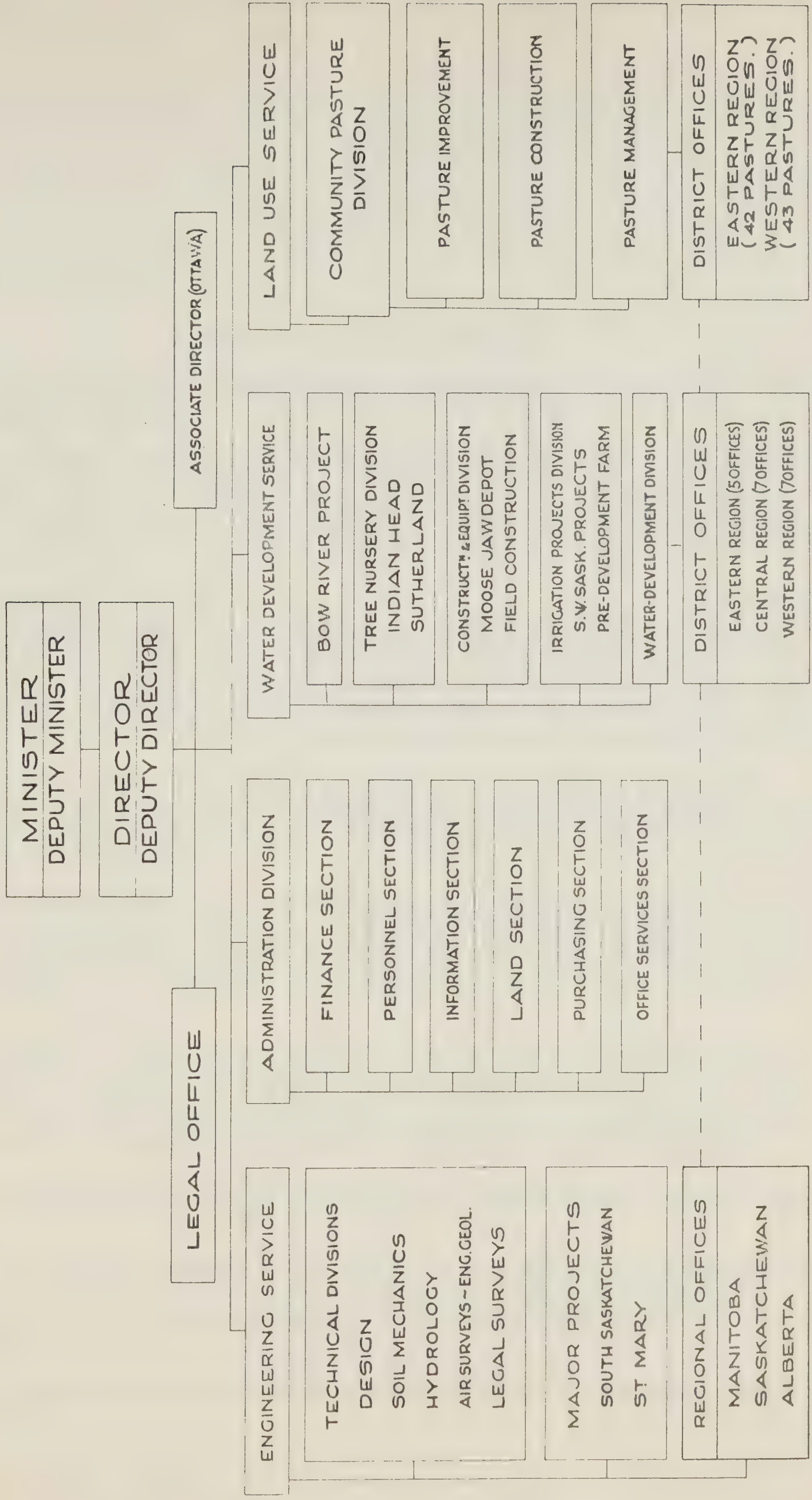
These activities are administered by a Director with headquarters in Regina, who is responsible to the Deputy Minister of Agriculture in Ottawa. The following is a resumé of PFRA activities in the 1963-64 fiscal year.





# P.F.R.A ORGANIZATION

October 1, 1964







## ADMINISTRATION DIVISION

Administration of PFRA according to the acts, regulations and policies is carried out by this division through the following units:

*The Personnel Unit* services a staff of 1,200 full-time employees, and up to 600 seasonal and casual workers at the peak of the construction season. Additional responsibilities were transferred to it during the year from Ottawa. Also, the unit developed branch programs to improve techniques in promotion competitions, counseling, recruiting and staff selection. The full effect of these innovations will be felt the coming year.

*The Finance Unit* prepares estimates, controls the budget, pays accounts and receives revenues; processes pay lists, travel claims and construction contracts; and directs the accounting in the field offices. It also provides financial services for ARDA in Western Canada. The 1963-64 budget of PFRA exceeded \$32 million. Estimates of \$29,600,000 were submitted for 1964-65. The year's revenues, mainly from community pastures and irrigation projects, totaled \$1,850,000. A study begun in late 1963 is aimed at greater use of financial and cost records for program planning, cost accounting and related techniques.

*The Office Services Unit*, in addition to providing clerical, stenographic and other office services at headquarters, is responsible for office equipment and supplies, staff housing and office accommodation for PFRA as a whole. Special duties include office equipment appraisal, space planning studies, and systems and procedures reviews.

*The Purchasing Unit* provides motor vehicles, capital equipment and bulk purchases of construction materials and supplies. It maintains a current list of suppliers for use throughout the PFRA area, finds new sources of supply, and investigates and reports accidents involving PFRA vehicles and motorized equipment. In 1963-64, with semi-centralized purchasing, 224 formal tenders were processed, valued at \$973,000.

*The Information Unit*, while providing information for departmental and public use, gave emphasis during the year to working more closely with the Department's Information Division in Ottawa. This resulted in a wider distribution of radio tapes and movie film for television. Sixty-five news items were issued as press releases, feature articles, television scripts and radio tapes. Displays were sent to 27 Class A and B fairs, several to special meetings and one to the Royal Winter Fair in Toronto.

Five new brochures covered the St. Mary and Bow river irrigation projects, community pastures, tree nursery stations and the water development program.

The photographic section met 1,150 requests for services ranging from exact-scale reproductions for the engineering divisions to movies, field assignments and enlargements for displays. The section took 5,000 photographs and made 27,000 prints, and also shot and edited 7,500 feet of black-and-white and color movie film.

The library processed 1,013 accessions, circulated 204 periodicals and distributed about 80,000 brochures.

The Land Section secures land control for PFRA projects, administers this land and keeps records on it. Land under PFRA jurisdiction included the following:

LAND INVENTORY ON MARCH, 31, 1964

Projects	Title	Easement Lease, etc.	Total
		(acres)	
Water conservation and reclamation:			
Alberta	198		
Saskatchewan	30,639	1,494	
Manitoba	3,476	74	35,881
-----			
Minor irrigation:			
Maple Creek	11,004		
Swift Current	16,350		
Val Marie	10,440		37,794
-----			
Major Irrigation:			
St. Mary River	13,806		
Bow River	107,365		
South Sask. River	59,170	54,684	235,025
-----			
Community pastures:			
Saskatchewan	1,235,283	437,792	
Manitoba	2,061	318,183	
Alberta		142,720	2,136,039
-----			
Total	1,489,792	954,947	2,444,739
-----			



## WATER DEVELOPMENT SERVICE

This service gives financial and technical aid for construction of farm and community water conservation projects, and for large water storage and irrigation works where there is special need. It also administers irrigation projects owned and operated by the federal government in southwestern Saskatchewan, the Bow River project in Alberta and the Irrigation and Demonstration Farm at Outlook, Sask. The service also includes the Equipment and Maintenance Division with headquarters at Moose Jaw, and the tree nursery stations at Indian Head and Sutherland, Sask.

### Field Services

The 1963 season opened with light runoff in most of the PFRA area for an average of six days starting in the third week of March. Most farm dugouts and dams had ample water and the majority of PFRA community projects were filled. This was followed in most prairie areas by good rainfall throughout the growing season. As a result, requests for construction of farm projects declined from the previous year and no urgent maintenance of projects was needed. This freed staff for a heavy program of construction on new community projects, which continued to the end of the year.

Activities in the newly established northern districts continued to increase as more farmers became aware of the program. The Westlock area showed particular interest requiring the use of a mobile field survey unit. Also, future development of several large dams in the area was investigated.

Field services in 1963-64 are shown in the following table.

Type of Project	Preliminary calls	Inspections Final	Other	Number of surveys	Plans prepared	Total services
Dugouts	1,801	3,348	1,436	—	—	6,585
Stock watering dams	491	434	641	548	568	2,682
Irrigation	815	318	1,071	518	502	3,224
Community	227	75	704	41	18	1,065
Combined	3,334	4,175	3,852	1,107	1,088	13,556

Total expenditure on individual projects: \$889,733.33

Total expenditure on small community projects: \$121,599.32

*Dugout pumping.* This program continued in areas of need; 216 farm projects were served by pumping an estimated 48 million gallons of water.

*Emergency community well drilling.* This was concentrated in Saskatchewan, where 32 wells were constructed and approved for payment at a cost of \$59,881.07, averaging \$1,871 per well. The federal government's share was \$20,958.37.

### Large Water Storage Projects

Construction was carried out on eight large developments, as follows:

*Conjuring Creek.* The contract for construction was awarded in October, 1963. This creek flows from the western end of the Riding Mountain in Manitoba. Specifications call for building a dam 20 feet high and 1,000 feet long, capable of storing about 1,000 acre-feet of water. It was too late for the contractor to start before freeze-up, but much of the material was purchased during the winter for an early start in the spring.

*Stephenfield Dam.* Work started in 1962 and it was completed in 1963. Located on the Boyne River about 12 miles upstream from Carman, Man., the project was requested to overcome a chronic water shortage. It includes a gated riparian conduit and timber chute spillway, and is designed to store about 3,600 acre-feet of water.

*Mossy Dam.* The contract was awarded in October, 1963, for a concrete control structure on the Mossy River at the outlet from Lake Dauphin, Man. Its purpose is to improve control of the lake's level. Because of the lateness of the season, the contractor postponed the start until the spring of 1964, but purchased materials and prefabricated some components during the winter. By starting as soon as possible after spring break-up, he planned to meet the completion date of July 31, 1964.

*Theodore Dam.* Located on the Whitesand River 25 miles northwest of Yorkton, Sask., this is a multipurpose project with a capacity of 12,000 acre-feet of water. It will provide benefits along 40 miles of river channel downstream from the reservoir. The project consists of an earth-filled embankment 45 feet high and 1,200 feet long, with a concrete chute spillway and riparian outlet. Construction started in the fall of 1962 and was scheduled for completion in July, 1964.

*Avonlea Creek Storage.* This is a community water storage dam and reservoir constructed on Avonlea Creek, a tributary of Moose Jaw Creek, about 35 miles southeast of Moose Jaw, Sask. The reservoir can hold 6,000 acre-feet of water and will replenish several small irrigation projects, stock watering reservoirs and dugouts through 60 miles of stream channel. It includes a 45-foot high, earth-filled embankment, a drop inlet spillway and riparian outlet. Construction began in the fall of 1962 for completion in the summer of 1964.

*Summercove Dam.* Located on the Wood River in southwestern Saskatchewan, this dam provides water for downstream irrigation and stock watering in the Mankota area. Improvements have increased the reservoir's capacity to 1,600 acre-feet, and added a permanent, concrete chute spillway through the north abutment. The work was completed in November, 1963.

*Welwyn Dam.* The contract was awarded on February 6, 1964 for a medium-size water development project to store about 400 acre-feet. Located on Beaver Creek 1½ miles northeast of Welwyn, Sask., the structure is to improve water supplies in the creek for stock watering and other riparian use. Construction will commence in the spring.

*Carolside Dam.* Construction of a spillway at the dam on Berry Creek near Carolside, Alta., started in the fall of 1962 and was completed in 1963. The new structure raises storage capacity in the Berry Creek reservoir to 30,000 acre-feet, sufficient to irrigate about 10,000 acres of land downstream.

## **Irrigation Projects**

These projects are developed, operated and maintained by PFRA.

### **Rehabilitation, Southwest Saskatchewan**

Six irrigation projects and 25 reservoirs are controlled by PFRA in this region. The six projects are at Val Marie, West Val Marie, Eastend, Consul, Maple Creek and Swift Current, covering 25,000 acres of developed, irrigable land. Another 15,000 acres operated by the province or under private lease receive water from PFRA reservoirs. The main product of most of this land is forage to feed range cattle in winter and to maintain breeding herds so that grazing resources may be properly used.

Two major problems on the projects are rough terrain and canal seepage. Both conditions tend to saturate the soil, causing alkaline salts to rise to the surface and producing poor yields. This demands a continuous program of improvement. During 1963, 1,450 acres were scraper-levelled by the Parkinson method and several canals were lined. The program has doubled or tripled production on large acreages of irrigated land, in spite of water shortages in some areas.



Meetings were held on the projects to discuss the formation of water users' associations, with a view to transferring the projects eventually to local water users. Associations would finance the operation and maintenance of projects by gradually increasing water charges from \$1.50 to \$3 per acre over the next five years.

### **Bow River**

The irrigation season lasted from April 29 to October 23. Consumption of water remained about the same. Water storage was below average at the close of the season, but there was sufficient to meet any possible irrigation demand in the following spring.

Canals and drainage ditches were sprayed with 2,4-D, and a mixture of 2,4-D and 2,4,5-T was used for the first time to control brush and trees in the Arrowwood district. Submerged aquatic weeds were treated experimentally with Aqualin for a second year with satisfactory results. Emergent water weeds were sprayed with a mixture of dalapon and fenoprop, which gave better control than the 2,4-D in an emulsion of diesel oil and water used in 1962.

No major structures were built. The program of replacing old wooden structures was continued and several miles of lateral canals in the Hays district were straightened or replaced to improve irrigation efficiency. Sections of canal in the Vauxhall district were lined with polyethylene film to prevent water conveyance losses and reclaim adjacent land that was waterlogged.

In the Hays community pasture another 300 acres were leveled for irrigation. A second pump was installed to supply water to 300 acres leveled in 1962.

For the first time, the Alberta Land Development Service took over supervision, surveying and planning of the land leveling program. Extension is the province's responsibility and PFRA has gradually withdrawn from this field.

*Agricultural Operations.* Crop yields on the project were generally good although the quality of hay suffered through heavy rains during harvest. The acreage sown to sugar beets doubled and production of canning peas and beans increased. Potato acreage stayed constant, but total production increased with wider use of fertilizers and better techniques. There was some interest in growing fresh vegetables but progress was slow. Market development, packaging, handling and distribution need a more aggressive approach.

With plentiful supplies of feed grown in other prairie areas, the price of hay was low and there was more local feeding of livestock than for several years. There was renewed interest in swine, with several farmers enlarging and improving their buildings and equipment for hog raising. No surplus hay remains in the district as the unused feed was dried and sold to processors.

A starch plant opened at Vauxhall in 1963 helped to bolster returns to potato producers. It processes cull and low-grade potatoes.

*Settlement.* Land settlement is drawing to an end. No new farmers were allocated land and extensions to the project were used for community pastures. A few settlers left the project and their parcels were divided among 13 farmers remaining. On December 31, 1963, there were 142 resident farmers at Hays. Advances made to farmers in the district to assist in purchasing buildings, materials, livestock and fencing amounted to \$20,500.99, bringing total expenses under this program to \$157,007.69 at December 31.

### **Irrigation Demonstration Farm**

A wide selection of field crops were grown on the Predevelopment Farm to demonstrate the types of irrigated crops that are successful in the Outlook area. The irrigation techniques were as varied as possible for the same purpose.

Corn was the most successful of the specialty crops grown for silage. It matured quite early and yielded about 20 tons of green silage per acre. This was placed in a bunk silo and used late in the fall to finish feeder cattle at the station. A larger acreage of corn was planned for the following year. Potatoes also proved quite successful, yielding 10 to 12 tons per acre.

The mechanical grazing experiment started in 1961 was continued. An excess of alfalfa caused the death of one animal, but this fault was rectified by changing from straight alfalfa to a brome-alfalfa mixture and green oats. Plans are under way to develop a pasture of similar size for comparing mechanical grazing with regular pasturing.

### **Project Maintenance and Construction**

This section employs a regular staff of 75 to 80 with casual help as needed.

The Equipment and Supply Depot, Moose Jaw, made repairs ranging from relatively minor work on cars to overhauling heavy, earth-moving equipment. A total of 375 jobs of this nature were undertaken at a cost of \$118,857.54. The trade shops manufactured many items including trailers, water troughs, precast structures, furniture, etc., mainly for community pastures. Most of the work was done in winter to employ construction staff based in Moose Jaw.

Construction crews worked on 125 projects at a cost of \$151,343.27. This was mostly maintenance and improvement work on irrigation projects in southwestern Saskatchewan and on community dams where local contractors were not available. Larger undertakings, using PFRA forces, included construction of a second dam to store water at the Tree Nursery Station, Indian Head, and a new pumping plant and pumphouse on the West Val Marie project.

### **Tree Nursery Stations**

The stations at Indian Head and Sutherland distributed 5,056,000 deciduous and 174,000 coniferous trees to 5,086 farmers in the spring of 1963. This was 31 percent less than in 1961 and 17 percent less than 1962, mainly as a result of severe drought in 1961, which sharply reduced production in the following year. Among farmers, Saskatchewan had 74.5 percent of the trees, Manitoba 23.3, Alberta 2.1 and the Peace River district 0.1. Of these, 39 percent were for field shelterbelt plantings (722 miles) and the remainder for farmstead shelterbelts. Federal, provincial and municipal plantings took eight percent of the 1963 distribution.

Field operations for the culture and production of tree seedlings extended from mid-April to late October. Harvesting and storage of deciduous trees took place in late September, October and November. Over 8 million plantings were produced from the 1961-62 sowings for distribution in 1964. Production of 10 million trees will be possible through land improvement carried out over the past two years. The second storage dam built at Indian Head during the year will also help to increase and ensure production in dry periods through irrigation.

Investigations continued at Indian Head, including herbicide and insecticide tests, seed and storage studies, propagation and performance trials, defoliation and dates of planting.



## LAND USE SERVICE

This service is responsible for development and operation of community pastures. The program started in 1937 and interest in it has increased as new and growing demands for land use adjustment and for more and better pastures have come to the fore.

### Pasture Operations

There were 75 pastures serving 7,229 patrons in 1963. Livestock handled were 141,008 cattle, 473 horses and 3,652 sheep. The losses were 799 cattle and horses dead or missing, and 75 sheep dead. This was slightly over 0.5 percent of the livestock pastured.

Three new pastures were opened at Kelvington and Foam Lake in northeast Saskatchewan and at Mulvihill, 100 miles north of Winnipeg. The 15,000 acres at Mulvihill were constructed by PFRA for the province some years ago, but PFRA took over the management in 1963.

A fourth new project was created by dividing the 65,200-acre Royal community pasture west of Prince Albert, Sask., into two separate units. The east half retains the name of Royal; the west half was named Meeting Lake pasture. Another 8,800 acres were fenced in 1963 and each pasture now has about 36,760 acres.

Grazing was generally satisfactory. However, there was very little precipitation in southwest Saskatchewan and southeast Alberta after July, 1963, and with little or no runoff in this area in 1963 and 1964, a critical water shortage has developed in a number of pastures.

To cope better with the rapidly increasing size of pasture operations, another supervisory territory was established in northwest Manitoba with headquarters at Dauphin. The other districts are centered at Brandon, Weyburn, Regina, Swift Current, Kindersley and Saskatoon. The seven districts are divided into eastern and western regions by a line running north and south near Moose Jaw.

### Grazing Allocation and Fees

Several policy changes and increases in grazing rates and breeding service fees took effect in April, 1963. PFRA assumed responsibility for grazing allocations in 1964, based on need, proximity to pasture and past patronage. A deposit of \$2 per head is required before adult cattle are accepted, and this is credited against grazing fees at the end of the season. Changes in allocations and other minor changes will be made gradually over 3 to 5 years to minimize any adverse effects. New grazing rates include a one percent perhead per day tax levy to be handed to rural municipalities, local improvement districts, etc., to compensate for loss of tax revenue on community pasture lands. Fees for 1963-64 were (per head):

- Cattle 6 cents per day (including 1 cent tax levy)
- Horses 8 cents per day (including levy)
- Sheep 12 cents per month (provide own herder)
- Cows \$5 (breeding service)
- Calves \$4 (of current year, sucking with dam, born before August 1)
- Colts \$5 (of current year, sucking with dam, born before August 1)

Minimum grazing fees per head per season are : cattle \$5, horses \$7 and sheep 40 cents.

### Hay and Feed Grain

About 5,600 tons of green feed were harvested on community pastures in 1963. In addition, 28,000 bushels of oats were harvested at Monet, Beaver Hills, Wellington and Bitter Lake, where oats were seeded to prepare for grassing. This hay and grain feeds the bulls and headquarters stock.

The fire hazard was critical in the fall of 1963 owing to the good stands of grass and dry weather. But there were only a few small fires caused mainly by lightning.

Motorized units working out of Moose Jaw maintained 1,165.5 miles of fireguards and constructed 32 miles of roads in 28 pastures. Also, several miles of roads in other pastures were maintained by hiring equipment and by managers using pasture equipment. No buildings were destroyed by fire: all have approved fire extinguishers ready for immediate use.

### Insurance

Forty-three pastures have adopted a form of mutual insurance that covers most losses, except those due to contagious diseases and parturition. The premiums vary from 35 cents to \$1 per head. Three pastures were covered by a Saskatchewan Government Insurance policy, which was optional to patrons, and 29 pastures had no form of insurance.

### Livestock Diseases

No serious outbreaks of disease occurred in community pastures. Several pastures had more cattle than usual infected with pinkeye and footrot, which made extra work for management in treating them. Some pastures were involved with the Health of Animals Branch in the control of brucellosis and tuberculosis, entailing extra work in rounding up cattle and working them through the corrals to obtain blood samples for the brucellosis test and to inoculate for tuberculosis.

### Breeding Service

A total of 1,578 bulls were used in community pastures during 1963. Of these, 1,131 were PFRA bulls and the remainder were rented from pasture patrons. They served 44,239 cows. Also, five artificial insemination projects were conducted at Kindersley, Eagle Lake, Laurier, Wellington and Coalfields pastures, serving 1,718 cows. PFRA supplied the facilities, clean-up bulls and semen at Kindersley and Eagle Lake. The artificial breeding co-operatives at Kindersley, Weyburn and Estevan handled all other aspects of the operation, charging \$5 to \$7 per cow.

To meet pasture requirement, PFRA bought 240 yearling bulls and 175 bulls of two years and over. They came from 89 purebred breeders in Saskatchewan and Manitoba, and five bull auctions including Regina, Brandon, Weyburn, North Battleford and Swift Current. The yearling bulls were bought in May and June and moved to the Archie and Bitter Lake bull stations for a year before being put into the breeding service. The other bulls went straight to the pastures and were used for breeding in 1963.

In the previous fall, 246 bulls unfit for service were sold for slaughter. There were 32 bull casualties during the pasture season.

### Construction and Improvement

Eight crews worked on construction and five on pasture improvement and maintenance during 1963.

*Construction.* This included building 287 miles of fence, 7 corrals, 2 pasture dwellings and 19 miscellaneous buildings for pasture headquarters. The largest task was the construction of eight new pastures which were ready for partial operation in 1964. The locations and fenced acreages are:

Saskatchewan – Spiritwood (13,280) north of Spiritwood,  
Hazel Dell (14,240) northwest of Yorkton,  
Cowessess-Sakimay (7,037) northeast of Broadview,  
Ochapowace-Kahkewistahaw (7,832) northwest of Broadview.



Manitoba — Pasquia (1,380) southwest of The Pas,  
Duck Mountain (21,440) northwest of Dauphin,  
Lenswood (17,064) northeast of Swan River,  
Narcisse (9,280) north of Winnipeg.

*Improvement.* Pasture improvement was concentrated on irrigation development, grass seeding, development of stock watering facilities, land clearing and brush control. Seventy acres were developed under the border dike system of irrigation and 400 acres for flood irrigation. Crews prepared 3,500 acres and seeded them to grass, and developed 122 new stockwatering sites. Land was cleared on 10,000 acres, including 7,000 acres by the ball-and-chain method, 1,000 by blade-crusher equipment and 2,000 by conventional means. Aircraft sprayed 5,000 acres along fence lines and in cleared areas to control brush. The vegetation was mainly willow, aspen and western snowberry.

## ENGINEERING SERVICE

This service provides the engineering for the investigation, planning, design and construction of PFRA projects. It also assists other agencies such as the International Joint Commission, the Prairie Provinces Water Board and the Greater Winnipeg Floodway Advisory Board.

The major planning and design work for PFRA is done at the Regina headquarters and the Soils Mechanics and Materials Division in Saskatoon. Regional engineering offices in the three provinces provide services for field investigations and supervision of construction and the operation of projects. Special project offices are set up as needed to supervise investigations and construction on large irrigation projects such as the St. Mary and South Saskatchewan rivers.

### Design Division

A large part of the year's work was on the South Saskatchewan River project, involving planning, designing, and preparation of specifications and plans for contracts. Plans and specifications were prepared and contracts advertized for water storage on the Conjuring Creek and Mossy River projects in Manitoba and the Welwyn Dam in Saskatchewan. The division also drew up plans for a pumping plant at Gravelbourg and for changes at the West Val Marie pumphouse, which were built by PFRA staff.

Other plans were for construction of Drain E in the central block of the Bow River project, and preliminary designs were completed for renovation or replacement of the inlet structure for the East Arrowwood syphon. Two large water conservation schemes in Alberta and Manitoba – Sarnia and Shellmouth – needed considerable designing, as did several smaller structures. Other jobs included checking quantities for completed contracts and making preliminary investigations into projects under consideration.

### Hydraulic Laboratory

Most of the model work was for studies of the South Saskatchewan River project, including the design of the spillway approach channel and crest abutment, the river closure operation and possible modifications to the outlet basin for Tunnel No. 4.

### Air Photo Analysis and Engineering Geology Division

Engineering geology studies were completed on Penticton Creek, B.C.; Oldman and Paddle rivers and Pincher Creek, Alta.; Beaver and Swan rivers, and Moose Mountain Creek, Sask.

Preliminary air photo studies were made for selecting damsites on Paddle River, and at Skull Creek and Foam Lake R.M., Sask. Detailed air photo studies were completed for two community pastures at Sakimay-Cowessess and Ochapowace-Kahkewistahaw near Broadview, Sask. Brief air photo studies were made for 11 ARDA community pasture proposals in Alberta.

Photogrammetric maps were made of parts of the Beaver, Swan, Qu'Appelle and Makwa rivers, and Skull and Meeting creeks, Sask.; Valley River and Wilson Creek, Man.; and Oldman River, Parlby Creek and Paddle River, Alta.

Of special interest were air photo enlargements made of the reservoir area of the South Saskatchewan project to aid in planning the brush clearing program; also a set of maps scaled at one inch per mile for all PFRA community pastures in Manitoba.

New air photo coverage of the Buffalo Pound Lake area was acquired through the Interdepartmental Committee on Air Surveys. Existing small-scale coverage of extensive areas in north-central Alberta and Saskatchewan was purchased from National Air Photo Library.



## Soil Mechanics and Materials Division

Investigations included 37,000 feet of drilling on 22 projects. Over half of this was for the South Saskatchewan River project and Shellmouth Dam on the Assiniboine River project.

The laboratories tested soil samples from test drill holes, sand and gravel samples from pits and stockpiles, and construction materials such as cement, waterstop and steel reinforcing submitted for acceptance under contract specifications. Field laboratories were maintained at Waterton, Stephenfield and Theodore dams for construction control tests to guide resident engineers.

Investigation and design reports were prepared for 13 projects, and reports on eight special laboratory or design studies. Construction plans and specifications were prepared on earthwork, concrete and cement for projects, including the Qu'Appelle River Dam and final embankment stage of the South Saskatchewan River Dam. As in previous years, a continuing inspection program was maintained to measure and record the performance of embankments and structures, either completed or under construction.

## Hydrology Division

The division provides information on stream flow, climate and watershed development potential, and is also the secretariat of the Prairie Provinces Water Board and hydrologic advisor to PFRA staff with the international water boards. These duties entailed 99 investigation or studies during the year.

The investigations dealt with the flood potential of streams for spillway design, optimum reservoir size for adequate stream regulation, preparation of climatic maps to aid irrigation land classification, study of water development potential in complete watersheds, forecasting of stream flows for construction work and related matters.

Information on prairie stream flows and meteorological parameters is limited. To make the best use of it, and hence make hydrologic studies more reliable, the division studied regional hydrologic characteristics. The floods of the mid-1950's created active interest in flood potential, and to cope with many requests for information, good use was made of a report on "The Magnitude and Frequency of Floods in Alberta, Saskatchewan and Manitoba," which the division completed recently. In the 1960's the sequence of low runoff years has stimulated interest in stream-flow reliability and low-flow characteristics. To meet this interest in drought, the division completed this year an extensive study of all prairie stream-flow data to develop regional patterns of water yield and variability of runoff.

For similar reasons, regional studies have been completed on probable maximum precipitation, maximum persisting dew points, depth-area-duration characteristics of great rainstorms, evaporation, and relationships between air and reservoir water temperatures.

The division also became the secretariat of the Saskatchewan-Nelson Technical Advisory Committee established early in 1963. The committee will prepare a study outline showing how the waters of the Saskatchewan-Nelson system may be augmented by storage and/or diversion.

## Surveys Division

Since 1962, all request for legal surveys in Alberta have been contracted to private firms. In Saskatchewan they are done by the Surveys Division of PFRA. Contracts awarded to private firms in 1963-64 included legal surveys for drains, reservoirs and damsites on the St. Mary Irrigation project and various water development projects. The four contracts totaled \$7,000.

Division staff completely revised the survey of the Maple Creek Irrigation project covering 56 quarter-sections and including re-subdivision, retracements, supply and drainage rights-of-way, access roads and road diversions. Retracement surveys were also made on 48 miles of interior and exterior Indian Reserve boundaries before construction of new pastures on the Ochapowace, Kahkewistahaw, Cowessess and Sakimay reserves. The final survey and plans will be completed after the pastures are in operation.

Other surveys were made for rights-of-way at Gainsborough community project and Highfield and Lightning Creek reservoirs, for relocating the Swift Current main canal and subdivision in the Rush Lake Irrigation District, and parcel surveys at the South Saskatchewan River project and Gull Lake pasture.

The division is compiling a detailed list of all surveys on PFRA projects including, where necessary, the areas of each parcel affected.

### **Regional Offices**

The regional engineering offices carried out a broad program of investigation, construction, operation and maintenance of water development projects. The more important ones are reviewed briefly.

#### **Assiniboine River**

Most of the work on this river was dike improvement and topographic surveys. About three miles of dike in six locations were widened and raised, and rock protection was placed along the toe of 1,500 feet of eroding bank. Three short ring dikes were built to protect farm homes near St. Francis Xavier, and three drains were excavated to accelerate removal of flood water. Five gated-culverts were run through dikes and minor repairs were made to Mill Creek control structure. To stabilize dikes and prevent erosion, 3,500 rooted willows were planted and grass was seeded on about 45 miles of dike and borrow pits.

Work on the Shellmouth project was mainly to continue general topographical surveys at the damsite and reservoir, construction of a test fill at the damsite and additional hydraulic studies in the Winnipeg office. Surveys included drill hole ties, layout and control surveys of test fill, checking control levels and detailed surveys of five existing valley crossings upstream from the dam.

The test fill, built in six weeks ending in mid-November, was 235 feet by 850 feet at the base and 55 feet high. Test apparatus installed during construction continued to record through the winter.

Under an agreement, PFRA builds the Shellmouth dam and the Province of Manitoba completes the diversion canal from the Assiniboine River to Lake Manitoba near Portage la Prairie. PFRA and the Manitoba government set up an advisory board to co-ordinate the activities.

#### **Northwest Escarpment and Interlake**

Work was concentrated on two main projects, as in previous years. The first involved enlargement of seven miles of the Icelandic River channel downstream from Arborg, which was finished in 1963. Provincial engineers supervised the project, which was based on flood control proposals made by PFRA, and the two governments shared the costs equally. Work remaining in 1963 included completing a traffic bridge across the channel, completing several land transactions, and cultivating and seeding the development to grass.

The other major activity was in the Wilson Creek experimental watershed, which was initiated in 1957 on an equal cost-sharing basis with the Province of Manitoba. Its purpose is to learn more about flash floods and heavy sedimentation characteristics of many streams originating from the east slopes of the Riding, Duck and Porcupine mountains. Weather and hydrometric observation stations have been established in the headwaters of Wilson Creek, access roads and trails built, two headwater storage reservoirs developed, and surveys of geological, botanical and topographical features of the area carried out. Also undertaken were experiments in bank protection, vegetative plots studies, tree planting programs and sediment measurements. The main program on the watershed was again to record data on stream discharge, sedimentation and climatological observations, along with routine operation of the project.



## **Peguis and Fisher River Indian Reserves Flood Control**

On behalf of the Indian Affairs Branch, Department of Citizenship and Immigration, PFRA is investigating prospects for drainage or flood protection on the reserves, with a view to developing agriculture. The field work, including agricultural appraisal and a large-scale topographical survey, was completed before April, 1963. A report on remedial measures for Fisher River was submitted, and two more reports produced in the current year covered the Peguis Reserve and specific, isolated drainage problems.

## **Pembina-Winkler Storage and Irrigation**

The United States, Manitoba and Canadian governments have worked together since 1960 on a comprehensive report. PFRA undertook two phases of the study: development of water storage in the Pembina Valley, Manitoba, and the design of alternative systems of irrigation for the Winkler area. All field work was completed by December, 1962, and the reports were submitted in February, 1964.

## **Buffalo Pound Water Supply**

PFRA installed facilities late in the 1950's to maintain water levels in Buffalo Pound Lake and assure water supplies for Regina and Moose Jaw. This involved pumping water from the South Saskatchewan River and improving storage facilities in the lake. In 1963, 27,000 acre-feet of water was pumped, which helped to meet all demands and to raise the lake's level from 1,671 to 1,672.7. Since the operation began in 1958, over 100,000 acre-feet of water has been pumped from the South Saskatchewan.

Raising the water level and increasing storage capacity are needed to meet expected demands over the next few years, when pumping will be disrupted by flooding as the level in the reservoir is raised by construction of the South Saskatchewan River Dam.

The higher water level in Buffalo Pound reservoir in turn necessitated a new causeway (Highway No. 2) across the north end of the lake. Construction of the causeway jointly by the provincial and federal governments started in 1962 and was completed in the spring of 1963.

## **British Columbia Project Investigations**

Preliminary engineering investigations and a report were completed on rehabilitation of two irrigation projects within the City of Penticton. This would involve some 2,000 acres of irrigable land devoted primarily to tree fruits. The original gravity systems supplying these areas were built about 1905 and badly need replacement if the land is to continue in agricultural production. PFRA investigations included hydrologic studies, geological and foundation exploration of selected storage and diversion dam-sites, inventory of existing works, route studies and cost comparisons of alternative diversions and distribution mains. The reports also considers combining upstream storage on Penticton Creek to serve both irrigation and municipal needs.

## **Alberta Project Investigations**

Preliminary engineering reports were prepared on four projects: Blood Indian Creek, Hanna and Sage Creek channel improvements, and the Western Irrigation District. Investigations continued on the Chain Lakes, Pincher Creek and Bow River projects. Preliminary investigations were started on five other projects; Three Rivers, Paddle River, Donalda, Parlby Creek and Eastern Irrigation District.

*Blood Indian Creek.* This project involves construction of a dam 545 feet long and 48 feet high, with a combined inlet spillway and riparian outlet structure, and a 50-foot wide emergency spillway. The reservoir would hold 3,000 acre-feet of storage for stock watering and irrigation of over 400 acres of creek flats downstream.

*Hanna.* Three proposals were investigated for additional storage in Fox Lake to assure Hanna's water supply.

*Sage Creek.* An investigation for channel improvements was made at the request of the Department of External Affairs for the International Joint Commission. This was to assess the cost, usefulness and apportioning of water between Canada and the United States.

*Western Irrigation District.* A preliminary report was completed on the proposal to renovate the inlet to the the district's "A" system of laterals and the Delroy flume. Further steps await results of a study by ARDA into the operating costs and the benefits of irrigation in Alberta.

*Chain Lakes.* The project involves construction of two dams to store about 14,000 acre-feet between them. The south dam, a rolled earth fill, is to be 40 feet high and 1,800 feet long; the north dam 47 feet by 1,200 feet. Work was confined to obtaining more building information on the spillway and downstream borrow areas at the south dam, and on conduits at both dams.

*Pincher Creek.* Surveys and investigations to date indicate that a reservoir capacity of 15,000 acre-feet would be possible by building a dam 117 feet high.

*Three Rivers.* Field investigations on a promising damsite on the Oldman River indicate that a dam 236 feet high and 1,300 feet long would impound 400,000 acre-feet of water. Preliminary investigations involved topographical surveys of the site, photogrammetric mapping of the reservoir and a seismic survey of the depth of bedrock, using two deep drill holes.

*Paddle River.* Located about 70 miles northwest of Edmonton, the project was investigated to find potential reservoir sites for flood protection on the Paddle River flood plain and to supply water to Mayerthorpe and Barrhead. Vertical and horizontal control points were established for photogrammetric mapping of two proposed reservoirs on the Little Paddle River. Also, a preliminary hydrology study was made of storage capacities required to alleviate serious flooding.

## Major Projects

### St. Mary Irrigation

Located in southern Alberta, this project involves the construction of works to irrigate about 500,000 acres extending between Cardston in the southwest and Medicine Hat. By agreement, the federal government is responsible for engineering and supervision of construction of the whole project, and the cost of constructing the main works and connecting canals. Alberta finances construction of the distributory works and is responsible for settlement and all other agricultural development on the project. The federal government also operates and maintains the main reservoirs and connecting canals, and is reimbursed at a maximum rate of 25 cents per acre-foot of water delivered to the province for distribution to the irrigated areas.

Construction began in 1946 and all main works have been completed, except the Waterton to Belly River diversion canal and control works for Waterton reservoir. The distribution works now serve 304,000 acres.

To March 31, 1964, capital expenditure by the federal government was about \$29,815,000, and by Alberta about \$20,084,000. The federal share includes operation and maintenance, and a large portion of this is recovered through the charges for water delivery.

*Engineering and Construction.* Designs were made for control works of structures on the Waterton Reservoir and the Waterton to Belly River canal. Surveys, investigation, planning and design were continued on structures for the distribution systems still to be built. In addition, a complete redesign of the Lethbridge-Coaldale tract was undertaken. This tract has been in operation for up to 60 years, and structures and canals need extensive replacement.



Construction of the Waterton Dam embankment and spillway was completed. A contract was awarded for construction of part of the Waterton to Belly River canal, and tenders were called for a contract to construct a drainage tunnel for the Waterton Dam.

*Improvement and Maintenance.* Only minor capital expenditures were needed for altering or adding to existing works on the project in 1963. Maintenance included further construction of drains along the main canal to control seepage, replacement of worn timber bridge decks with concrete, gravel facing of eroded canal sections, and general building and ground maintenance.

*Operation.* Water delivered from the St. Mary reservoir amounted to 452,000 acre-feet in 1963. The demand was heavy until good rains in June and July reduced irrigation considerably.

A significant development in new areas of the project is the request by farmers for water rights on additional acreage over their classified areas. This contrasts with previous requests for reductions in classified acreage granted in many cases before the dry conditions of the past three years. The acreage irrigated in the new areas rose to 104,900 in 1963 compared with 100,800 in 1962, for a total of about 226,000 irrigated acres on the entire project.

### South Saskatchewan River

Located in south-central Saskatchewan, this is a large, multi-purpose, water conservation development that will employ the river for irrigation, power, domestic and industrial water supplies, and recreation. Reservoir control will be achieved by building two dams: the major one on the South Saskatchewan about halfway between Outlook and Elbow, and the other at the divide between the valleys of the South Saskatchewan and Qu'Appelle rivers.

Under the agreement signed in 1958, the federal and provincial governments share the costs of development. The federal government is responsible for all engineering associated with planning and supervision of construction of the dams, and creation of the reservoir, as well as the major share of development costs. The province's principal responsibility is all other phases of development, chiefly in providing facilities for irrigation, recreation and the generation of electrical power.

*Design and Planning.* The work carried out during the year by the Design and Soil Mechanics divisions was to prepare final plans and specifications for seven contracts covering work on the project. Contracts were awarded for construction of the spillway crest, Qu'Appelle River dam, bulkheads for tunnels and cathodic protection for tunnels (stage 1); also for embankment stage 4, supply of cement and flyash. Considerable preliminary designing was undertaken on the spillway chute and basin structure for a contract to be awarded later in 1964.

Final plans and specifications were prepared and the tenders received for control gates and hoists for the Qu'Appelle and South Saskatchewan river dams, embankment stage 5. Contracts will be awarded early in 1964.

*Construction.* The major emphasis continued to be on five river diversion tunnels and tunnel control facilities, which are in their final stages. A significant point was reached with completion of the tunnels and diversion of the river through them, making possible the final stage of embankment construction. Satisfactory progress was made on the embankment on the far west side of the river, now 85 percent completed, and on the east embankment, 42 percent completed.

Two other major undertakings were commencement on the crest section of the spillway and on the Qu'Appelle River Dam. The latter structure in the Qu'Appelle Valley about 12 miles southeast of Elbow will contain the main reservoir and control the release of water into the Qu'Appelle River system.

Approximately 64 million cubic yards of earth have been moved at the damsite to date, of which about 39 million cubic yards have been compacted in the embankment. In addition, a large quantity of concrete has been placed during the past year, mostly in the tunnels. The total labor force did not vary greatly, ranging between 800 and 1,000. The value of contract work completed in the year was \$13,512,737, bringing the total work done under contract to \$61,407,349.

APPENDIX I

WATER DEVELOPMENT PROJECTS COMPLETED AND ASSISTANCE PAID, 1935-64

Types of Project	DUGOUTS			DAMS			IRRIGATION PROJECTS			TOTALS	
	Completed	Assistance \$		Completed	Assistance \$		Completed	Assistance \$		Completed	Assistance \$
MANITOBA											
Individual	15,793	2,082,530.40		335	28,351.51		269	108,703.08		16,397	2,219,584.99
Neighbor	75	20,183.03		16	5,024.00		19	11,994.24		110	37,201.27
Small Community	7	12,530.86		25	134,367.47		2	30,582.54		34	177,480.87
Large Water	-	-		29	2,120,142.82		6	617,217.00		35	2,737,359.82
TOTAL	15,875	2,115,244.29		405	2,287,885.80		296	768,496.86		16,576	5,171,626.95
SASKATCHEWAN											
Individual	47,637	6,998,899.47		5,304	542,816.63		2,803	725,747.18		55,744	8,267,463.28
Neighbor	421	133,818.44		60	13,100.42		130	66,020.88		611	212,939.74
Small Community	400	386,788.02		202	1,069,527.17		70	666,247.97		672	2,122,563.16
Large Water	-	-		49	4,161,506.37		35	4,079,910.00		84	8,241,416.37
TOTAL	48,458	7,519,505.93		5,615	5,786,950.59		3,038	5,537,926.03		57,111	18,844,382.55
ALBERTA											
Individual	12,254	1,947,144.57		3,255	384,368.57		1,308	345,400.25		16,817	2,676,913.39
Neighbor	54	19,930.05		16	5,843.50		17	6,567.32		87	32,340.87
Small Community	91	188,877.42		119	748,358.72		55	669,769.14		265	1,607,005.28
Large Water	-	-		6	150,015.00		18	693,004.00		24	843,019.00
TOTAL	12,399	2,155,952.04		3,396	1,288,585.79		1,398	1,714,740.71		17,193	5,159,278.54
GRAND TOTAL	76,732	11,790,702.26		9,416	9,363,422.18		4,732	8,021,163.60		90,880	29,175,288.04



# APPENDIX II DEVELOPMENT AND OPERATION OF COMMUNITY PASTURES UNDER PFRA, 1938-64

Fiscal Year	No. of Pasture Units in Operation	Area of Land in Pastures (acres)	Total Cost of Construction of Pastures \$	Livestock Units Carried on Pastures	Acres per Unit of Livestock	Cost of Operation		Net Operating cost per Unit of Livestock \$	Average Charge per Unit Livestock to Farmers \$
						Revenue \$	Operating Costs \$		
1938-39	14	189,800	165,995.03	3,231	58.7	6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1	21,632.71	20,945.84	1.82	1.82
1940-41	35	884,500	1,004,305.91	23,245	38.1	43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2	65,434.89	50,607.22	1.52	1.97
1942-43	45	1,261,100	1,129,487.54	51,127	24.7	98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3	111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,699,012.21	59,997	22.3	151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1	167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6	198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4	203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1	204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5	211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1	221,129.45	217,867.45	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4	335,327.16	237,742.13	3.08	4.34
1952-53	59	1,652,020	3,754,098.41	94,137	17.5	438,513.75	373,737.36	3.97	4.66
1953-54	60	1,678,736	3,963,572.83	109,583	15.3	507,179.14	490,907.89	4.48	4.55
1954-55	60	1,696,900	4,273,916.79	106,322	15.9	496,805.78	466,153.69	4.38	4.66
1955-56	60	1,728,700	4,509,668.59	108,499	15.8	499,045.13	501,540.73	4.67	4.60
1956-57	61	1,759,570	4,832,863.47	117,441	14.9	548,601.01	508,002.83	4.33	4.67
1957-58	61	1,796,275	5,119,317.01	119,398	15.0	552,938.40	607,129.23	5.08	4.63
1958-59	62	1,815,265	5,509,958.43	117,032	15.5	542,606.90	686,448.88	5.87	4.64
1959-60	64	1,818,464	5,800,342.43	124,812	14.6	705,785.32	742,915.21	5.95	5.65
1960-61	65	1,896,173	6,254,224.42	122,813	15.4	656,708.97	879,811.85	7.15	5.35
1961-62	68	2,088,704	6,845,655.79	146,672	14.2	860,808.25	1,128,255.75	7.69	5.87
1962-63	71	2,114,412	7,283,657.67	139,643	15.1	871,955.43	1,044,241.41	7.48	6.24
*1963-64	75	2,149,292	7,677,379.13	141,723	15.2	1,168,641.26	1,193,820.31	8.42	8.25
						9,888,457.85	10,291,262.54		

A livestock unit indicates one head of cattle, one horse, or five sheep.

A pasture unit may include one or more pastures, but it is operated under one management.

\*Tax levy not included in revenue (1963-64 levy was \$145,630.58).

**APPENDIX III**  
**MAJOR PROJECTS – IRRIGATION, RECLAMATION AND WATER STORAGE**  
 (Projects by Special Votes of Parliament, Administered by PFRA)  
 to March 31, 1964

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
<b>MANITOBA</b>						
Assiniboine River Diking & Cut Off	Brandon	River Control	Incomplete	—	—	1,322,744
North-West Escarpment Reclamation Proj. – Riding Mt. Area	Dauphin	Watershed Control	Incomplete	—	—	1,296,176
Fairford River Project	Lake Manitoba	Flood Control	1960	—	—	287,751
Saskatchewan River Reclamation — Pasquia Area	The Pas	Reclamation	Incomplete	135,000	—	2,256,388
Shellmouth Dam & Portage Diversion	Russell	River Control	Incomplete	—	430,000	141,113
<b>ALBERTA</b>						
Bow River (a) Purchase of Canada Land & Irrigation Company	Medicine Hat	Irrigation	Incomplete	235,000	408,862	54,398
(b) Development & Construction						
St. Mary	Lethbridge	Irrigation	Incomplete	510,000	320,000	2,353,182
Belly River Diversion	Lethbridge	Irrigation	1950	—	—	21,688,316
						20,221,133
						53,901
<b>BRITISH COLUMBIA</b>						
Cawston Benches	Keremeos	Irrigation (pump)	1951	629	2,000	185,491
Chase & Johnston – Western Canada Ranching	Kamloops	Irrigation	1951	755	—	98,243
Western Canada Ranching #2	Kamloops	Irrigation (pump)	1950	54	—	58,069
Lillooet – Pemberton	Pemberton	River Control	1953	—	—	1,056,539
South Thompson – Niskonlith Gravity Project	Kamloops	Irrigation	Incomplete	1,030	1,200	12,282
Westbank Project	Kelowna	Irrigation	1950	1,200	2,500	537,450
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	—	32,229
Penticton West Bench	Penticton	Irrigation (pump)	1953	800	—	66,362
B.C. Fruitlands	Kamloops	Irrigation	Incomplete	2,000	—	200,000

(Above includes ONLY Construction Costs)





APPENDIX IV  
PFRA EXPENDITURES BY ACTIVITIES, 1935-64

ADMINISTRATION DIVISION

Ottawa and Regina Administration	\$ 3,357,164
----------------------------------	--------------

LAND USE SERVICE

Cultural Work – Soil Drifting, etc. (Exp. Farm Service)	4,966,394
Community Pastures – Construction, Operation and Maintenance	25,499,148
Movement of Settlers	227,841

WATER DEVELOPMENT SERVICE

Small Farm Projects	26,309,191
Community, Large Water Storage and Irrigation Projects	21,074,223
Supervision	4,696,901
Equipment – Purchase and Repairs, Service Depot	9,811,944
Tree Nursery Stations	420,990
Bow River Irrigation Project	32,805,339

ENGINEERING SERVICE

Surveys, Design, Soil Mechanics, Drainage Studies, Legal Surveys	
Supervision of Construction	24,325,952
St. Mary Irrigation Project	28,385,297
South Saskatchewan River Project	74,537,443
Assiniboine River Dyking	1,485,874
Shellmouth Dam and Portage Diversion	141,113
B.C. Reclamation and Development, including Lillooet Project	3,310,182
Land Protection and Reclamation, Manitoba and Eastern Canada	4,119,094
Miscellaneous Projects – Construction	4,776,879
	<u>\$270,250,969</u>

REVENUE:

Community Pasture Operations	\$10,710,951
Irrigation Project Operation & General Revenue	5,381,981
	<u>\$16,092,932</u>









Gov. Doc.  
Can  
Ag

CAI DA 20  
/- A56

1964

Report on

Prairie farm rehabilitation and related activities

# ANNUAL REPORT

CANADA DEPARTMENT OF AGRICULTURE

Department of Prairie Farm  
REHABILITATION BRANCH

1965







ANNUAL REPORT

ON PRAIRIE FARM REHABILITATION AND RELATED ACTIVITIES

1964 - 1965

CANADA DEPARTMENT OF AGRICULTURE





# CONTENTS

	Page
INTRODUCTION .....	
ORGANIZATION .....	
ADMINISTRATION DIVISION .....	1
Finance .....	1
Personnel .....	1
Purchasing .....	1
Office Services .....	1
Information .....	1
Land .....	1
WATER DEVELOPMENT SERVICE .....	3
Field Services .....	3
Dugout Pumping .....	3
Emergency Community-well Drilling .....	3
Large Water Storage Projects .....	3
Arborfield Dugout .....	3
Avonlea Creek Storage .....	4
Chain of Lakes (Willow Creek) Project .....	4
Conjuring Creek Project .....	4
Fairview Project – Plato Dam .....	4
Mossy River Dam .....	4
Pilot Mound Dam .....	4
Ste. Rose Dam .....	4
Theodore Dam .....	4
Welwyn Community Storage .....	5
Kindersley-Eston Pipeline Project .....	5
Irrigation Projects .....	5
Rehabilitation, Southwest Saskatchewan .....	5
Bow River Project .....	5
Agricultural Operations .....	6
Settlement .....	6
Irrigation Demonstration Farm .....	6
Project Maintenance and Construction .....	6
Tree Nursery Stations .....	6
LAND USE SERVICE .....	7
Pasture Operations .....	7
Grazing Allocations and Fees .....	7
Haying and Regrassing .....	7
Fires and Fire Protection .....	7

## CONTENTS (continued)

	Page
Breeding Service .....	8
Livestock Diseases .....	8
Livestock Insurance .....	8
Pasture Construction .....	8
Pasture Improvement .....	8
<b>ENGINEERING SERVICE .....</b>	<b>9</b>
Major Projects .....	9
South Saskatchewan River Project .....	9
Design and Planning .....	9
Construction .....	9
St. Mary Project .....	10
Engineering and Construction .....	10
Improvement and Maintenance .....	10
Operation .....	10
Regional Offices .....	10
Manitoba .....	11
Saskatchewan .....	11
Alberta .....	12
Technical Divisions .....	12
Design .....	12
Air Photo Analysis and Engineering Geology .....	13
Soil Mechanics and Materials .....	13
Hydrology .....	13
Legal Surveys .....	14
<b>APPENDICES</b>	
I Water Development Projects Completed and Assistance Paid 1935-65 .....	15
II Development and Operation of Community Pastures under PFRA 1938-65 .....	16
III Major Projects - Irrigation, Reclamation and Water Storage to March 31, 1965.....	17
IV PFRA Expenditures by Activities, 1935-65 .....	19



## INTRODUCTION

The Prairie Farm Rehabilitation Act was passed by Parliament in 1935 to provide a four-year program for the rehabilitation of drought and soil-drifted areas of Manitoba, Saskatchewan and Alberta. By amendment in 1937, land utilization and resettlement were included, and in 1939 the Act was extended indefinitely.

Land use and water conservation on individual farms were originally the main activities qualifying for assistance under the Act, and are still important in the PFRA program. However, PFRA responsibilities over the years have expanded to include development of large-scale irrigation and reclamation projects, and a broad program of community pastures.

Other significant changes in the scope and functions of PFRA have occurred in recent years. In 1961, the program was extended to include all agricultural areas of the Prairie Provinces.

In 1963, the federal tree nurseries at Indian Head and Sutherland, Sask., were transferred to PFRA from the Research Branch. All aspects of the extensive tree-distribution program now are performed by PFRA.

PFRA also assists in administering and providing technical services for the Agricultural Rehabilitation and Development Act in Western Canada.

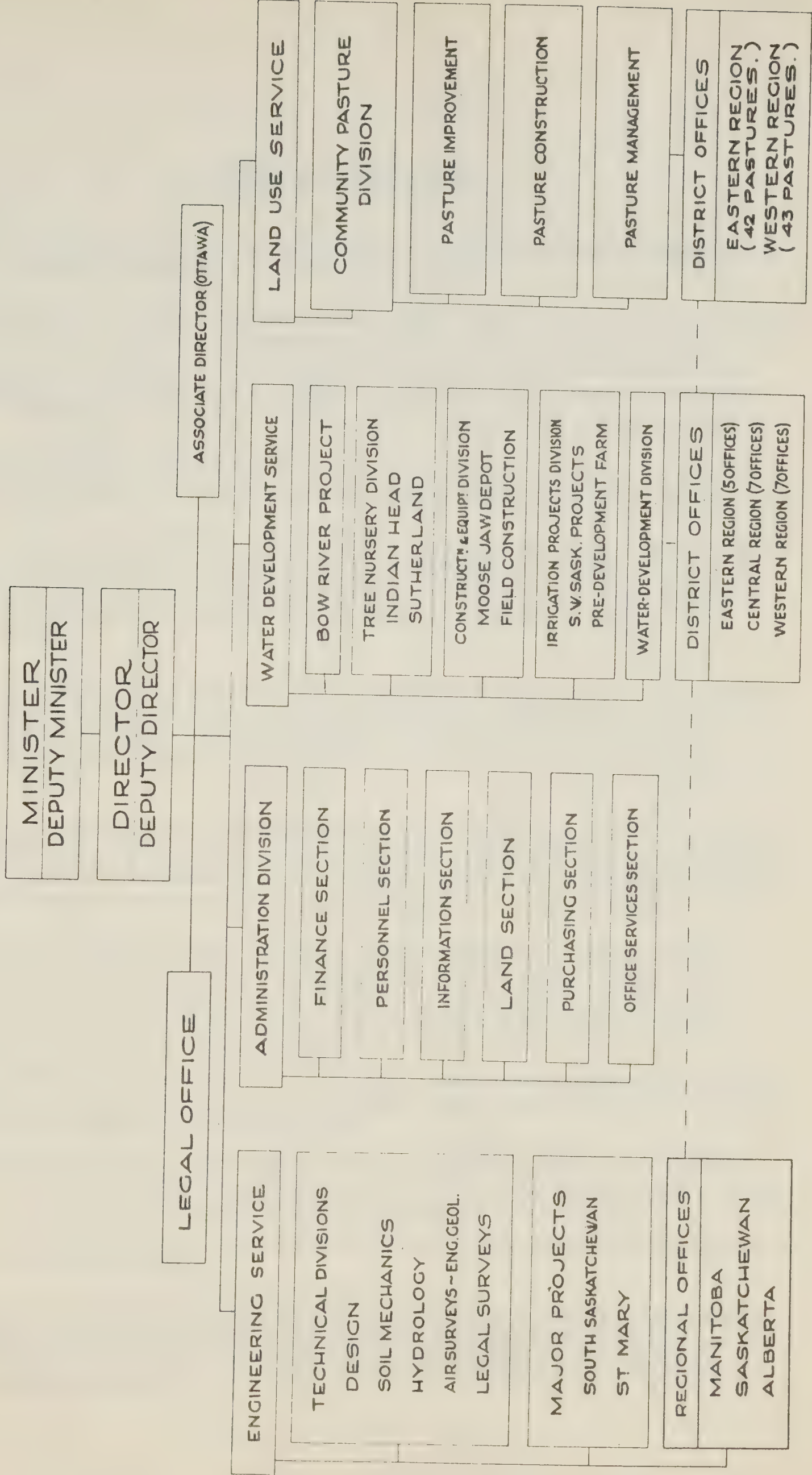
The following is a summary of activities of the Prairie Farm Rehabilitation Administration for the fiscal year ending March 31, 1965.





# P.F.R.A ORGANIZATION

MARCH 31, 1965







## ADMINISTRATION DIVISION

Operating through the following sections, the Division fulfills its administrative responsibilities in accordance with the acts, regulations and policies governing PFRA.

*The Finance Section* prepares estimates, controls budgets, pays accounts and receives revenues; processes paylists, travel claims and construction contracts; and directs the accounting operations of field offices. It also provides financial services for ARDA in Western Canada. The 1964-65 PFRA budget exceeded \$31 million. Estimates of \$37 million for 1965-66 have been submitted. Revenue for the year of \$2.1 million was derived mainly from fees paid for use of community pasture and irrigation facilities.

Plans for implementing a new system of "responsibility center accounting," based on Recommendations of the Royal Commission on Government Organization, were developed during the year.

*The Personnel Section* services a staff of 1,200 full-time employees, and up to 600 seasonal and casual workers at the peak of the construction season. During 1964-65, more emphasis was given to improving techniques in staff recruitment, selection, training and counseling. New record-management systems were introduced to provide a more efficient service to the operational services and to the Department at Ottawa.

*The Purchasing Section* procures motor vehicles, equipment, and bulk quantities of construction materials and supplies. It maintains a list of suppliers for use throughout the PFRA area, finds new sources of supply, and investigates and reports on accidents involving PFRA vehicles and other motorized equipment. In 1964-65, with semi-centralized purchasing, 210 formal tenders worth more than \$900,000 were processed.

*The Office Services Section* was reorganized during the year to accommodate a new centralized transcribing unit and improved filing and central registry systems. Studies were begun to assess the need for record and electronic data processing facilities. The Section provides office equipment and supplies, mail and messenger services, staff housing and office accommodation for PFRA as a whole.

*The Information Section* provides a full range of information services for Departmental and public use. In 1964-65, the Section increased its support to the technical program through exact scale reproduction work, time-study photography, rescaling of mosaics and related technical photography. Close liaison was maintained with the information and library services of the Department at Ottawa to ensure coordination of regional and national activities.

Seventy-eight releases were issued to the news media as news items, feature articles, television film scripts and/or radio tapes. Displays were sent to 58 fairs, and to several meetings and conferences. Four brochures were prepared on various PFRA activities.

The photographic unit met 1,100 requests for services, ranging from exact scale engineering reproductions to material for displays. The laboratory processed 4,000 photographs and produced 25,000 prints. The unit also shot and edited 7,000 feet of black-and-white and color movie film.

The library processed 933 accessions, circulated 172 periodicals, and dealt with 15,000 requests for information and branch publications.

*The Land Section* secures land control for PFRA projects and is responsible for administering land records, issuing leases and identifying surplus properties. The emphasis during the past year has been on the establishment of a complete land inventory of all PFRA holdings. Land under PFRA jurisdiction includes the following:

LAND INVENTORY ON MARCH 31, 1965

Projects	Title	Easement, lease, etc.	Total
		(acres)	
Water conservation and reclamation:			
Alberta	198		
Saskatchewan	14,742	1,969	
Manitoba	3,618	88	20,615
-----			
Minor irrigation:			
Eastend	5,830		
Cypress Lake	5,349		
Maple Creek	11,005		
Swift Current	16,362		
Val Marie	10,502		49,048
-----			
Major irrigation:			
St. Mary River	13,766		
Bow River	121,135		
(exchange lands)	9,468		
South Sask. River	66,450	59,954	270,773
-----			
Community pastures:			
Saskatchewan	1,193,834	567,148	
Manitoba	4,609	446,103	
Alberta		142,720	2,354,414
-----			
Miscellaneous:			
(Tree nurseries, pre-development farm, hydrometric site, etc.)	1,234		1,234
-----			
Total	1,478,102	1,217,982	2,696,084
-----			



## WATER DEVELOPMENT SERVICE

This Service provides financial and technical assistance for construction of farm and community water-conservation projects, as well as for large water-storage and irrigation works where there is a special need. It also administers irrigation projects owned and operated by the federal government in southwestern Saskatchewan. The Bow River project in Alberta and the Irrigation Demonstration Farm at Outlook, Sask., are administered by the Water Development Service, as are the Construction, Equipment and Supply Division, which operates a service depot at Moose Jaw, and the tree nurseries at Indian Head and Sutherland, Sask.

### Field Services

Light runoff (only about five days) occurred throughout most of the PFRA area in the spring of 1964. A large percentage of PFRA community storage reservoirs did not fill and many farm dugouts and dams also started the summer season at a low level. Thunderstorms in June and July helped replenish some reservoirs. No emergency maintenance was required, freeing staff for a heavy construction program.

Activity continued to increase in northern areas as farmers showed a greater awareness of the PFRA program, which has been available to the northern part of the Prairie Provinces since 1961. Numerous requests for field services came from the North Battleford and Dauphin regions, and several large storage projects were investigated in the Melfort area.

The following table indicates the field services provided in 1964-65.

Type of project	Preliminary calls	Inspections Final	Other	Number of surveys	Plans prepared	Total services
Dugouts	2,216	3,538	942	-	-	6,696
Stockwatering dams	525	318	780	469	406	2,498
Irrigation	722	209	1,021	365	302	2,619
Community	291	82	974	147	52	1,546
Combined	3,754	4,147	3,717	981	760	13,359

Total expenditure on individual projects: \$861,324

Total expenditure on small community projects: \$150,176

*Dugout Pumping.* This program continued where there was a distinct need and where supplementary water was available. PFRA filled 388 farm dugouts by pumping 86 million gallons of water.

*Emergency Community-well Drilling.* Eighteen wells were drilled in Saskatchewan and one in Alberta. Total cost was \$41,288 for an average cost per well of \$2,170. The federal government's share was \$16,576.

### Large Water-storage Projects

Construction was carried out on 10 large projects, as follows:

*Arborfield Dugout.* This is the first of two structures to be built on this project. The second is a storage dam, on which the only work completed has been the clearing of brush in the reservoir area.

The dugout is adjacent to Burntout Brook, 1 mile southwest of Arborfield, Sask. Surrounded by earth dykes, it holds 30 acre-feet of water, half of which is fed by natural flow through a 30-inch culvert

leading from a diversion on the brook. Storage may be increased to 50 acre-feet by auxiliary pumping. The dugout, which was completed in 1964, may be recharged during natural runoff or by releases from the upstream storage to be constructed. The project will supply domestic and stockwatering requirements.

*Avonlea Creek Storage.* This project consists of a dam and reservoir on Avonlea Creek about 35 miles southeast of Moose Jaw. The reservoir, with a capacity of 6,000 acre-feet of water, will increase water supplies for small-scale irrigation and replenish stockwatering facilities through 60 miles of stream channel. The dam is 45 feet high and has a drop inlet spillway, a riparian outlet and an emergency earth spillway. Construction began in 1962 and was completed in November 1964.

*Chain of Lakes (Willow Creek) Project.* Construction of the Chain of Lakes Project in Alberta began late in 1964. It consists of two earth-filled dams, one on Willow Creek at the south end of the Chain of Lakes and the other at the north end on Stimson Creek. The larger south dam will have a reinforced concrete spillway and both dams will have gated outlets.

The main dam is about 10 miles south and 20 miles west of Nanton, Alta. It will be 44 feet high and 1,730 feet long, with a capacity of 14,000 acre-feet of water. The project is to provide water for the town of Claresholm, for supplementary irrigation of 11,000 acres of land, and for other local needs.

*Conjuring Creek Project.* Conjuring Creek is a tributary of the Assiniboine River. Between May and September, 1964, an earth-filled embankment 25 feet high and 900 feet long was built on this creek 2 miles northwest of Russell, Man. The reservoir created will hold 1,000 acre-feet of water, which can be released downstream for stockwatering and for domestic use in Russell. It has a drop inlet spillway. An emergency spillway has also been provided.

*Fairview Project – Plato Dam.* This project, on a coulee about 15 miles east of Eston, Sask., consists of a compacted earth dam 42 feet high, with drop inlet and emergency spillways. The reservoir created by the dam will hold 400 acre-feet of water for domestic use, stockwatering and weed spraying. Construction was completed in November, 1964.

*Mossy River Dam.* The northern outlet from Lake Dauphin in west central Manitoba is the Mossy River. A stop-log control dam was built immediately north of the lake shore between May and August, 1964. The structure is of reinforced concrete and has 10 stop-log bays. It is 225 feet long, and 13 feet from the stilling slab to the top of the piers. Water stored by the dam will be used for stockwatering and recreation.

*Pilot Mound Dam.* Late in 1964 a contract was awarded for construction of an earth-filled dam 2½ miles east of Pilot Mound, Man. When completed in 1965, it will be 500 feet long and 28 feet high with drop inlet and emergency spillways and a gated conduit to regulate low flows. During the winter the contractor cleared the bed of the reservoir, which will store 450 acre-feet of water for domestic use, stockwatering and, possibly, irrigation.

*Ste. Rose Dam.* The Turtle River carries most of the runoff from the northeastern slope of Manitoba's Riding Mountains to Lake Dauphin. The village of Ste. Rose du Lac is on the river about 6 miles upstream from the lake. A contract was awarded in October, 1964, for construction of a reinforced concrete stoplog control dam just south of the village to provide for stockwatering and domestic needs. This dam is 25 feet high from floor slab to top of piers and has five bays. By enclosing the work area with plastic sheeting, it was possible to work throughout the winter and the dam was completed before the March 31 deadline.

*Theodore Dam.* Located on the Whitesand River 25 miles northwest of Yorkton, the Theodore Dam rises 45 feet and can store 12,000 acre-feet of water. Agricultural and domestic needs along 40 miles of the river channel in two municipalities will be served. The dam is protected by a concrete chute spillway. Construction began in 1962 and was completed in September, 1964.



*Welwyn Community Storage.* The Welwyn Dam is on Beaver Creek, a tributary of the Assiniboine River, about 15 miles northwest of Moosomin, Sask. The project consists of a 25 foot high dam, drop inlet spillway, riparian outlet and emergency earth spillway. The reservoir has a capacity of 400 acre-feet and will provide water for domestic and stockwatering needs in parts of Saskatchewan and Manitoba. Construction was carried out in 1964 under contract. PFRA crews cleared the reservoir and improved the channel below the dam.

*Kindersley-Eston Pipeline Project.* A contribution of \$50,000 was made in 1964 toward the cost of installing rural water outlets along a newly constructed pipeline that supplies water from the South Saskatchewan River to the towns of Kindersley and Eston. PFRA helped finance the project to ensure a water supply to farms along the 40-mile length of pipeline that passes through an area unsuitable for surface water reservoirs and where runoff is unreliable. The amount contributed by the federal government was based on an estimate of the cost of developing community water reservoirs that would provide comparable benefits. The water outlets are expected to serve about 300 farmers, within a 10 mile radius of the pipeline, who have found it difficult to obtain adequate supplies of water for livestock.

### **Irrigation Projects**

PFRA developed all projects described in this section and operates and maintains them.

#### **Rehabilitation, Southwest Saskatchewan**

PFRA has six irrigation projects in this area: Val Marie, West Val Marie, Eastend, Consul, Maple Creek and Swift Current. In these six, 25,000 acres of land have been developed for irrigation and water is supplied from 25 reservoirs. Eight other major irrigation projects containing about 15,000 acres are operated by the province or under private lease and receive water from the PFRA reservoirs.

Most of the projects operated by PFRA are about 25 years old. Their main purpose is to produce forage for winter feeding of range cattle and to maintain breeding herds.

In 1964, several canals were lined to stop seepage and 1,534 acres of land were leveled in the continuing improvement program to combat alkaline soil conditions and increase production. Leveling has doubled and tripled production on large irrigated acreages despite some water shortages.

Farmers on the projects are being encouraged to form water-users' associations, so that they can accept responsibility for operating the projects at some future date. Water rates between 1964 and 1968 will be increased gradually from \$2 to \$3. These charges and improved crop production are expected to encourage farmers to take over and run the projects.

#### **Bow River Project**

Water was available for irrigation from May 21 to October 20. Consumption of water rose to 108,000 acre-feet from 92,000 acre-feet in 1963. Diversion from the Bow River was continued during the fall to ensure sufficient water in project reservoirs for irrigation in 1965.

All laterals and drains were sprayed with herbicides to control weeds, and Aqualin was again used experimentally to control submerged aquatic weeds.

Soil drifting filled 3½ miles of laterals, which had to be cleared before water could be delivered. The farmers involved were asked to practice better farming methods.

No new major works were built but PFRA continued to replace wooden field structures with concrete structures. Considerable work, lining canals with polyethylene and installing tile drains, was carried out to control water loss and land damage by seepage. This continuing program must be scheduled when weather permits, before or after the irrigation season. In providing additional drainage outlets for farm units, 22½ miles of open drain were excavated.

Leveling in the Hays community pasture was completed on another 300 acres, making a total of about 1,000 acres of irrigated pasture that has been improved.

**Agricultural Operations.** Periodic unfavorable weather conditions kept production per acre of most vegetable crops below normal, but overall production was higher than usual due to increased acreages of specialty crops. The main increases were in green peas and potatoes, the latter bringing record prices. These high prices caused the potato starch plant at Vauxhall to suspend operations for the balance of the year.

The hay acreage was reduced from previous years because of low prices. However, yield and quality were above normal and, due to the long cold winter, all hay in the district was sold at a good price.

**Settlement.** The number of settlers in the Hays area was reduced during the year to 136 families, as six of the original settlers sold or transferred their holdings.

Only two fencing loans, totaling \$2,219, were approved under the arrangement to lend money for buildings, materials, livestock and fencing. Total repayable loans under this program were \$159,226 at December 31.

#### **Irrigation Demonstration Farm**

A wide variety of grain, hay and row crops were grown under varied techniques at the Irrigation Demonstration Farm, Outlook, Sask. The purpose of this continuing program is to show the types of irrigated crops that can be economically produced in the area and the best methods of irrigating them.

Specialty crops grown included potatoes and corn and yields were good. Brome-alfalfa was the best producing hay crop, yielding more than 4 tons per acre.

The mechanical grazing trials started in 1961 were continued, as were the natural grazing operations on irrigated pasture.

The livestock program in 1965 will be conducted in cooperation with the Animal Science Department of the University of Saskatchewan. It will include mechanical grazing studies and an economic analysis.

#### **Project Maintenance and Construction**

A regular staff of 74 was employed by this section, with casual help hired as required.

The PFRA Equipment and Supply Depot at Moose Jaw made repairs ranging from minor repairs to vehicles and trailers to major overhaul jobs on heavy equipment. The 428 jobs completed cost \$131,504 plus labor. The trade shops manufactured 345 items including trailers, signs, water troughs and special equipment. Most repair and manufacturing work was done during the winter to employ construction staff when outside work was closed down.

Construction crews worked on 126 projects with the cost of materials and supplies amounting to \$130,882. Pasture service crews filled an additional 116 work orders at a cost of \$15,205. Painting in five pastures entailed an additional expenditure of \$8,079.

The transport fleet made 369 trips, hauling 5,743 tons 180,091 miles. Seventy percent of this work was for the Community Pastures Division.

#### **Tree Nursery Stations**

The tree nurseries at Indian Head and Sutherland distributed 8,697,000 deciduous and 151,000 coniferous tree seedlings and cuttings to 9,266 farms during 1964. This is 40 percent more than in 1963 and is the largest distribution ever achieved. New mechanical packing equipment and a new packing shed increased efficiency of distribution by 76 percent.

Seedlings were distributed to farms as follows: 78.7 percent to Saskatchewan, 18.8 percent to Manitoba, 2.4 percent to Alberta and 0.1 percent to the Peace River region. Of the total production of seedlings, 47 percent was used for planting 1,138 miles of field shelterbelts, 46 percent for home shelterbelts, and 7 percent for federal, provincial and municipal plantings.

The field season lasted from April 16 to November 18. The land area under production was expanded further by clearing and breaking old plantations.



## LAND USE SERVICE

A 1937 amendment to the Prairie Farm Rehabilitation Act provided for the removal of submarginal land from cereal crop production, and the reclamation of such lands for grazing by seeding it to grass and otherwise developing it for community pastures. Since then, continuous growth has earmarked the community pasture program. In 1964, the opening of eight new pastures brought the total to 83, with a fenced acreage of 2,314,077 acres. During the year, 7,206 patrons grazed 156,299 cattle and calves, 323 horses, and 1,800 sheep in the pastures.

There are seven districts under the program, with supervisors at Regina, Weyburn, Swift Current, Kindersley, Saskatoon, Dauphin and Brandon.

### Pasture Operations

The spring of 1964 was one of the driest on record for both precipitation and runoff. Low water levels at the close of the 1963 grazing season contributed to the water shortage, particularly in pastures in southwest Saskatchewan. The grass carryover at the end of 1964 grazing was less than normal, but should not seriously reduce carrying capacities.

Of the eight new pastures operating this year, two are within the boundaries of Indian reserves. This is the first time reserves have been used for organized grazing on a cost-per-head basis. The Cowessess-Sakimay pasture carried 1,317 cattle and calves, and 1,159 animals were grazed in the Ochapowace-Kahkewistahaw pasture. Other new pastures and the numbers of animals grazed were as follows: Duck Mountain 744, Hazel Dell 1,249, Lenswood 632, Narcisse 423, Pasquia 128 and Spiritwood 279.

### Grazing Allocations and Fees

PFRA assumed responsibility for allocating grazing privileges in 1964. This previously was handled by local advisory committees. Allocations are based on individual need, nearness to pasture and past patronage. A productive-man-work unit score is used in assessing each farmer's need. The PFRA allocations are reviewed and approved by the local advisory committees before grazing permits are issued. Each patron must pay \$2 per head for cattle and horses to validate his permit. Present grazing rates include a tax levy of one cent per head per day to reimburse the municipality or local improvement district for loss of tax revenue on community pasture lands. Per-head fees for 1964 were:

- Cattle - 6 cents per day (including one cent tax levy)
- Calves - \$4 per season (sucking with dam, born before August 1)
- Horses - 8 cents per day (including one cent tax levy)
- Colts - \$5 per season (sucking with dam, born before August 1)
- Sheep - 12 cents per month (provide own herder)
- Breeding service - \$5 per cow

Minimum grazing fees per head per season are: cattle \$5, horses \$7 and sheep 40 cents.

### Haying and Regrassing

Slough and upland hay crops were very light and some pastures did not harvest any hay. Those that did, including the Bitter Lake Irrigation Project, gathered in 3,931 tons for feeding bulls and head-quarters stock.

Tame grass was sown on 8,055 acres, with 5,508 acres of this going into crested wheatgrass, 600 acres in a mixture of brome and crested wheatgrass, and 1,947 acres in various other mixtures. This brings the total seeded to 188,854 acres.

### Fires and Fire Protection

Only one serious grass fire occurred in the pastures in 1964, when railway employees, burning right-of-way, let the fire get away from them. It destroyed 1,550 acres of grass.

Motorized units working out of Moose Jaw maintained 1,136.5 miles of fireguard, and constructed 51.5 miles of road in pastures which serves as fireguard.

### **Breeding Service**

There were 51,013 cows serviced under the pasture breeding program in 1964, of which 3,279 were bred artificially. Natural breeding required 1,744 bulls, 1,294 of them PFRA bulls and 450 rented animals.

Continuing its bull-development policy, PFRA purchased 244 yearling bulls to be developed at the Archie and Bitter Lake pastures, and 150 two-year-old bulls ready for service. The purchases included 376 Herefords, 5 Shorthorns and 13 Aberdeen Angus. A compilation of purchases, sales and casualties since 1963 leaves a balance of 1,314 bulls owned by PFRA.

Bulls are rented to the pastures for \$40 per year per bull. This, plus breeding fees of \$5 per cow, enables the breeding service to operate at cost.

### **Livestock Diseases**

No serious outbreaks of disease occurred in community pastures during 1964. Common disorders such as pinkeye and foot rot responded to treatment. Close liaison with the Health of Animals Branch is maintained to assist in controlling brucellosis and tuberculosis.

### **Livestock Insurance**

Forty-six pastures provided for mutual insurance covering all losses, except those occurring as a result of contagious diseases and parturition, at a cost ranging from 35¢ to \$1 per head. Six pastures were covered by a Saskatchewan Government Insurance policy optional to each patron. Thirty-one pastures had no insurance.

### **Pasture Construction**

Construction involved 215 miles of new fence as several pastures were enlarged, some cross-fenced and 53 others repaired. There are now 5,533 miles of fence enclosing 2,318,000 acres of pasture land. Four sets of corrals, four houses and 19 miscellaneous pasture headquarters buildings were constructed.

### **Pasture Improvement**

Light runoff and precipitation in the spring of 1964 made it necessary to pump water from creeks and large reservoirs via pipelines to rereservoirs and dugouts in some of the pastures, particularly in southwest Saskatchewan.

One dam, 91 dugouts, 32 wells, 9 windmills and 7 pressure systems were constructed for stockwater. In improving and maintaining stockwater facilities, 123 dugouts and dams were enlarged and 140 windmills and troughs moved or replaced.

Other pasture improvements included clearing 18,500 acres, brush spraying 16,000 acres, fertilizing 400 acres, developing 70 acres for irrigation, and preparing 16 miles of fireguard so that brush could be burned without risk of destroying grazing areas.



## ENGINEERING SERVICE

The Engineering Service provides engineering for the investigation, planning, design and construction of PFRA water development projects. It also provides technical assistance to the other PFRA services in the operation and maintenance of projects in which Canada retains an interest, and to several interagencies engaged in planning and implementing major works in large river-basin developments of interprovincial or international scope. The major interagencies are the International Joint Commission, the Prairie Provinces Water Board and the Greater Winnipeg Floodway Advisory Board.

The Engineering Service has two major project offices, at the St. Mary and South Saskatchewan River projects, and three regional offices, each serving a prairie province, at Winnipeg, Regina and Calgary. The Service also has five technical divisions: the Design, Hydrology, Air Photo and Legal Surveys divisions are at PFRA headquarters in Regina and the Soils Mechanics and Materials Division is at Saskatoon.

The offices at the two major projects supervise construction and carry out field planning. The regional offices conduct field investigations and overall project planning, and supervise construction of projects ranging in size from community water storages to major works involving provincial participation. The technical divisions do the detailed planning, designing and other engineering work necessary for implementing projects.

### Major Projects

#### South Saskatchewan River Project

This project, in south central Saskatchewan, will have the largest earthfill dam in Canada. It is a multipurpose, water-conservation project, storing and harnessing the river flow for irrigation, power production, domestic and industrial use, and recreation. The reservoir is being created by constructing two dams. The main dam is on the south Saskatchewan River midway between Outlook and Elbow. The secondary dam is in the Qu'Appelle River Valley.

The costs of development are being shared by the federal and provincial governments according to an agreement signed in 1958. The federal government is responsible for the planning, design and supervision of construction of engineering works required for the reservoir, and pays most of these costs. The Province is responsible for all other phases of development, mainly facilities for irrigation, production of hydro power, and recreation.

*Design and Planning.* Plans and specifications were prepared and tenders called for six contracts during 1964-65, to construct the following works:

- Stage II of the cathodic protection system for the tunnels;
- Plugging the low level inlets of the tunnels;
- Stage III embankment;
- Reservoir clearing;
- Spillway gates and hoists; and
- Spillway chute and basin.

Engineers also studied various alternatives to improve the stability of the embankment in the area of Coteau Creek, prepared and submitted plans for relocation of the Canadian Pacific Railway in the vicinity of the Qu'Appelle River Dam, and prepared a contract for gate installations at the Qu'Appelle Dam.

*Construction.* Emphasis in construction of the main dam centered on Stages IV and V of the embankment operations, the spillway crest and plugging the diversion tunnels. Satisfactory progress was maintained on embankment construction, with 72 percent of this work completed by the end of the year. Excavation has amounted to 85 million cubic yards, of which about 57 million cubic yards have been placed in the embankment. Concrete work to date totals 433,000 cubic yards.

During the year, the spillway crest, control shaft superstructures and installation of control gate hoists at the main dam neared completion; trash racks and low level tunnel bulkheads were installed; and satisfactory progress was made in other works, including those covered by the six new contracts mentioned above.

The value of work completed during the year amounted to 17.8 million dollars, bringing the total expenditures to date to 88.6 million dollars. The labor forces averaged 1,200 workmen during the summer. More than 100,000 visitors to the dam made use of the tourist pavilion provided for their convenience.

### **St. Mary Project**

On the St. Mary Irrigation Project in Southern Alberta, construction of works to irrigate about 500,000 acres of land is nearing completion. The main storage reservoirs on the Waterton and St. Mary rivers control the waters of these two rivers and the Belly River to supply water for irrigation requirements.

Canada pays the cost of constructing the main water storage, diversion and supply works and provides all engineering services required to develop the entire project. Alberta is responsible for constructing the water distribution system and for settlement and agricultural development on the project.

Canada operates and maintains the works it has constructed, and delivers water at cost but not exceeding 25 cents per acre-foot. Alberta recovers a portion of its cost through a \$10-per-irrigable-acre levy paid by the farmers involved.

All of the main works have been completed except parts of the Waterton to Belly River diversion canal. Distribution works are in operation to serve 304,000 acres.

Capital cost to the federal government to March 31, 1965, was approximately \$31,275,000, and to Alberta, \$20,559,000. A large part of the federal share, which includes costs of operation and maintenance, is recovered through the water delivery charges.

*Engineering and Construction.* The Design Division prepared plans for the control works for the Waterton Dam tunnel and structures on the Waterton to Belly River canal. Plans were completed and a report was prepared on the Lethbridge-Coaldale tract. Surveys, planning and designing continued for the distribution systems yet to be built.

Construction at the Waterton Dam included the outlet structure, drainage tunnel, installation of equipment in the main tunnel, and supply and placing of the spillway gates and hoists. A short section of the Waterton to Belly diversion canal was partly completed.

*Improvement and Maintenance.* Crews carried out maintenance work and minor construction at the St. Mary Dam and constructed drainage works along the main canal.

*Operation.* Timely rains and a generally cool summer decreased the demand for water during the operating season. About 360,000 acre-feet of water were delivered from the St. Mary Reservoir.

When record floods occurred in June on the three rivers supplying the project, all structures performed satisfactorily and reduced the severity of flooding downstream. Irrigated acreages in the new areas of the project increased substantially to 120,800 acres. The total number of acres irrigated during the year was 240,000.

### **Regional Offices**

Construction was carried out on 10 projects during the year and investigations were conducted on 30 prospective projects. The following is a brief summary of the activities of each regional office. Further details on construction activities are given under the Water Development Service.



## Manitoba

The regional engineering office in Winnipeg supervised construction of the Conjuring Creek Project, Mossy River Dam, Pilot Mount Dam and Ste. Rose Dam, as well as clearing of the reservoir area for the Shellmouth Dam on the Assiniboine River. The Shellmouth Dam, with its reservoir for storing 400,000 acre-feet of water, is one of the main works in a complex of projects to regulate the flows of the Assiniboine and Red rivers. The federal and provincial governments are sharing the cost of the projects, with PFRA engineers planning, designing and supervising the construction of the Shellmouth Dam Project. Late in 1964-65, after further topographic surveys and planning of the reservoir, tenders were called for the first stage of embankment construction.

For several years dyking has been carried out along the lower reaches of the Assiniboine River to control floods. During the year, PFRA constructed 2.7 miles of dyke in five locations. Where erosion had occurred, the banks were back-sloped and trimmed for a total distance of 4,200 feet, and protected with 3,500 cubic yards of riprap.

Investigations, ranging from preliminary studies to the compilation of engineering reports, included Birdtail Creek, Birnie Creek, Boyne River, Gilbert Plains Dam, Jackfish Lake Dam, Antler River Storage - Melita area, Valley River Storage, Victor Dam, Pequis and Fisher River Indian Reserve Flood Control, Pembina-Winkler Storage and Irrigation, and the Whitemouth River projects.

Engineers continued to investigate the Wilson Creek watershed, which lies in the Riding Mountain National Park and has a drainage area of 9 square miles. This is part of a study provided under a joint agreement between the federal government and the Government of Manitoba in the northwest escarpment and interlake region. Three projects have been undertaken cooperatively to learn more about flash floods and heavy sedimentation characteristics of many streams originating on the east slopes of the Riding, Duck and Porcupine mountains. They are the Pine River Storage, Icelandic River Improvement and Wilson Creek Experimental Watershed. The first two have been completed and studies are continuing on Wilson Creek watershed. Several installations have been made since 1957 in an effort to determine and evaluate the interaction of precipitation, runoff, sedimentation, soils geology, forest cover, farming practices, climate, wildlife and other factors in the drainage basins of the escarpment. During the year, PFRA maintained the various instruments used in measuring these environmental factors and recorded data.

## Saskatchewan

In addition to providing technical assistance on water storage and irrigation works in southwestern Saskatchewan, the regional engineering office at Regina supervised construction and carried out investigations on a wide range of water development projects during the year. They also provided services for special projects in British Columbia.

Construction was supervised on five new projects: the Arborfield, Avonlea Creek, Welwyn and Fairview projects, and the Theodore Dam. The regional office also carried out work on the Buffalo Pound Water Supply Project, which the Government of Canada continues to operate. In 1956, construction was completed on a two-lift pumping complex for raising water from the South Saskatchewan River over the height of land into the headwaters of the Qu'Appelle River. Forty miles downstream the water is stored in Buffalo Pound Lake to ensure supplies for Moose Jaw and Regina, and irrigation of part of the Qu'Appelle River flats. During 1964-65, a total of 21,360 acre-feet of water was pumped. At the end of the season the lower plant was removed, as it was about to be inundated by the rising pool of the South Saskatchewan River Reservoir. No. 2 pumphouse platform was raised 10 feet so that water could be pumped from the reservoir pool as required in 1965. Eventually, when the South Saskatchewan River Project is completed, water will be released from the Qu'Appelle Dam and flow by gravity into the headwaters of the Qu'Appelle River and from there into Buffalo Pound Lake.

Investigations included a reconnaissance survey and mapping of alternative water supply routes from the Qu'Appelle River Dam to the Regina-Moose Jaw Filtration Plant, a distance of some 60 miles; continuing studies on the Alameda Dam located on Moose Mountain Creek; and flood-control studies on Beaver River and Goosehunting Creek in northern Saskatchewan. Also, preliminary reports on investigations to date were prepared for Watson Dam, Helgason Dam and Semerau Dam.



From time to time, the Saskatchewan regional office is requested to furnish services in British Columbia for projects being developed under the Veterans' Land Act and projects sponsored by the provincial government, such as those being financed under the ARDA program.

During the year, PFRA completed a study and compiled a preliminary report for extension of the Penticton-West Bench Project. This work was carried out at the request of the Veterans' Land Act Branch, Department of Veterans' Affairs. Another project was undertaken late in the year, at the request of the British Columbia Government, to renovate the water supply and distribution system for the Penticton Irrigation District. This project is being financed under the ARDA program, with PFRA providing engineering services and supervising construction.

## Alberta

The office at Calgary investigated 12 water development projects, operated and maintained the Bow River Project, and supervised construction of the Chain of Lakes Project described earlier.

Regional engineers continued to investigate major storage possibilities at the Gap site and Three River site on the Old Man River, as well as potential storage sites on the Paddle River. Reports on studies of the Pincher Creek Project and the Therriault Project on Indian Farm Creek are nearing completion; and investigations are continuing on the Parlby Creek and Hanna Water Supply, Wabash Creek, Kimball-Pine Pound, Standard, Snake Creek and Mosquito Creek-Little Bow projects.

A comprehensive economic and engineering study of irrigation districts in Alberta was launched in 1964 under ARDA. The objects of the study are to determine the actual cost of operating an irrigation project and to assess the benefits that accrue to the economy through irrigation. Under the terms of the agreement, the study will be carried out in three phases:

*An engineering study* by PFRA to determine the costs of operating, maintaining and rebuilding the irrigation works.

*An economic study* by the Economics Branch of the Department to determine the primary benefits of irrigation, that is, the value of production from irrigated land compared with that from dry land in areas having similar soil and climate.

*An economic study* to determine the secondary benefits of irrigation, that is, how the benefits are distributed among different segments of the economy. This will be carried out by the University of Alberta, Department of Agricultural Economics, which also has the responsibility for bringing the three phases of the study together.

PFRA has carried out surveys and completed a final report on the annual cost-structure of the Eastern Irrigation District, which was chosen as the initial project to be examined in the study.

## Technical Divisions

### Design

Preference was given to planning, designing, and preparing specifications and plans for contracts on the South Saskatchewan River and St. Mary projects. Complete plans and specifications were prepared for six water development projects — Arborfield, Chain of Lakes, Fairview, Melfort, Pilot Mound and Ste. Rose — and contracts were awarded. Plans were prepared for modifications to the east inlet structure of Cypress Lake, for a temporary pumping platform at Cypress Lake and for raising the pumps at Pumphouse No. 2 on the Buffalo Pound Lake Project.

The Design Division also prepared plans and specifications for modification and improvements to the Condie Reservoir, a Saskatchewan Department of Agriculture project, and the Jackfish Lake Project in Manitoba.

Work is nearing completion on the design of Blood Indian Creek and Ekapo Lake conservation projects, Middle Creek Channel improvements, Elgin Dam and Gilbert Plains Dam. Preliminary engineering studies, including cost estimates, were completed on a flume across Rolph Creek on the Kimball-Pine Pound Canal, renovation of the Bassano Dam and replacement of the Brooks Aqueduct of the Eastern Irrigation District, the Helgason Dam and the Pleasant Valley Dam. Work continued on the Assiniboine River Project, with particular emphasis on the Shellmouth Dam. Considerable design work was done on the Shellmouth conduit.



The Hydraulic Laboratory operated by the Design Division was fully utilized throughout the year, with three major model studies undertaken. They are: modifications to the stilling basin of tunnel No. 4 at the South Saskatchewan River Project; studies on the pier and stop-log structure for the Ste. Rose Dam; and transitions, gatewell and stilling basin for the Shellmouth conduit.

#### **Air Photo Analysis and Engineering Geology**

Office air photo site selection and appraisal studies were completed on the more feasible sites for community dams within 16 rural municipalities in west-central Saskatchewan. Similar studies were carried out on Crowfoot Creek, Paddle River and Smoke Creek in Alberta; on Battle Creek and Goose-hunting Creek in Saskatchewan; and on Birdtail Creek and Whitemouth River in Manitoba.

Brief air photo studies were conducted on three areas in northern Alberta proposed as grazing reserves under the ARDA program.

Large-scale surficial geology studies were conducted at two damsites on Birdtail Creek and at one site on the Qu'Appelle River in Manitoba.

Topographic surveys by photogrammetric means were completed on reservoir areas along Connor Creek, Meeting Creek, Parlby Creek and Wabash Creek in Alberta; Milligan Creek, Moose Mountain Creek and Swan River in Saskatchewan; and Birdtail Creek in Manitoba.

The 60-mile route for a proposed pipeline or canal from the Qu'Appelle River Dam to the Buffalo Pound filtration plant was mapped. Marmot Creek watershed in Alberta was mapped in part to investigate the feasibility of using aerial photogrammetric techniques for determining alpine snowpack volume. Other mapping assignments included Rolling Hills reservoir in Alberta, local areas along the South Saskatchewan River, and various damsites where maps were required for geological and subsurface investigations. Deep excavations associated with construction of the South Saskatchewan River Dam were mapped in detail to record the geology of drift and bedrock strata.

A total of six photographic flights were made over the South Saskatchewan River Dam to record construction progress.

Work continued on a special program to assist the Prairie Farm Assistance Administration in determining cultivated acreage in 190 Indian reserves in the Prairie Provinces. Mosaics have been completed for 70 percent of the reserves and acreages delineated in 30 percent.

#### **Soil Mechanics and Materials**

In foundation investigations during the past year, the Division drilled 34,000 lineal feet of test holes and recovered nearly 10,000 samples on 16 projects. About half of this work was for the South Saskatchewan River Dam.

The main laboratory in Saskatoon handled 15,000 soil and concrete samples, and carried out about 116,000 tests. In addition, field laboratories were in operation at Conjuring Creek Dam and Waterton Dam, and laboratories were set up at the Chain of Lakes and Shellmouth projects.

Results of soils investigations and design studies were summarized in 16 formal reports and 10 letter reports, for which a total of 450 plans were drafted.

Inspection and testing services were supplied to 10 projects under construction. Test apparatus was installed and read to check the performance of structures during and after construction. A continuing program of inspecting completed structures and observing test apparatus was carried out on over 60 projects. Included in this inspection program were special studies on the effect of frost on structures, and observations on the durability of concrete and the performance of riprap.

#### **Hydrology**

The number of hydrologic problems referred to the Division for study during the year included 34 on water supply, 35 on flood potential and 41 miscellaneous. Although this was 11 more than in 1963-64, improved analytical techniques developed by the Division in regional hydrologic studies enabled regular staff to handle the extra work.

Acting as Secretariat for the Prairie Provinces Water Board and the Saskatchewan-Nelson Technical Advisory Committee, the Division completed a number of studies of interprovincial water problems. The Hydrometeorological Section was especially busy this year, due to many requests for information from government-sponsored interagency committees evaluating the broad aspects of watersheds.

In cooperation with the governments of Manitoba and Saskatchewan, the Division initiated a study of water supply and demand for the years 1980 and 2000 in the Assiniboine and Qu'Appelle watersheds for the Prairie Provinces Water Board. One important report, *Distribution and Variability of Runoff in Alberta, Saskatchewan and Manitoba*, was completed for the P.P.W.B.; and another, *Outline of Study of the Water Resources of the Saskatchewan-Nelson Basin*, for the Saskatchewan-Nelson Technical Advisory Committee. The Division also prepared several in-service reports on regional small-watershed runoff.

### Legal Surveys

As more surveys were required than could be accomplished with the personnel available, some were carried out by contracting with private land-survey firms.

In Alberta, surveys involving reservoirs, roads and drains were carried out for the St. Mary Project, the Bow River Project and small water developments. Five contracts were awarded amounting to \$3,300.

In Saskatchewan, two contracts were let totaling \$20,500. One covered a right-of-way survey for the Saskatchewan portion of the Shellmouth reservoir and the other was for monument reestablishment on the South Saskatchewan River Project.

PFRA surveyors retraced the external boundaries of the Sakimay, Cowessess, Kahkewistahaw and Ochapowace Indian reserves for the Land Use Service, and surveyed pasture boundaries on the Sakimay Reserve. Thirty-seven miles of surveying was carried out on this job.

On the South Saskatchewan River Project, six right-of-way surveys affecting 19 quarter sections were completed and registered, as were surveys for rebuilding monument in nine townships. Surveys yet to be done in 17 townships on this project will be completed in 1965-66.

Other surveys by PFRA included the Rush Lake subdivisions in the east and west blocks, additional right-of-way on the Herbert main canal, Kindersley-Elma parcel survey, Valeport Flats boundary survey, Tuxford Flood Control Project, Arborfield Community Storage Project (including the reservoir right-of-way and the pumpsite), and Melfort Community Storage (including the reservoir right-of-way and road diversions).

A detailed listing of all survey plans on record in the PFRA survey office was completed, and the area of each parcel of land surveyed was calculated. This information was required by the Land Division to implement a new system of keeping land records.



# APPENDIX I

## WATER DEVELOPMENT PROJECTS COMPLETED AND ASSISTANCE PAID, 1935-65

Types of Project	DUGOUTS		DAMS		IRRIGATION PROJECTS		TOTALS	
	Completed	Assistance \$	Completed	Assistance \$	Completed	Assistance \$	Completed	Assistance \$
<b>MANITOBA</b>								
Individual	16,251	2,188,359.79	341	29,642.88	281	114,422.87	16,873	2,332,425.54
Neighbor	76	21,407.27	16	5,024.00	19	11,994.24	111	38,425.51
Small Community	8	13,044.66	25	134,401.87	2	30,582.54	35	178,029.07
Large Water	-	-	32	2,352,228.80	6	617,217.00	38	2,969,445.80
TOTAL	16,335	2,222,811.72	414	2,521,297.55	308	774,216.65	17,057	5,518,325.92
<b>SASKATCHEWAN</b>								
Individual	49,270	7,387,600.95	5,388	560,854.53	2,894	764,557.93	57,552	8,713,013.41
Neighbor	426	135,256.94	61	13,226.84	136	71,612.54	623	220,096.32
Small Community	432	459,680.76	210	1,097,952.03	71	678,905.78	713	2,236,538.57
Large Water	-	-	53	4,836,025.51	36	4,129,910.00	89	8,965,935.51
TOTAL	50,128	7,982,538.65	5,712	6,508,058.91	3,137	5,644,986.25	58,977	20,135,583.81
<b>ALBERTA</b>								
Individual	13,314	2,193,104.01	3,384	408,729.16	1,357	367,645.94	18,055	2,969,479.11
Neighbor	59	21,917.21	16	5,843.50	17	6,567.32	92	34,328.03
Small Community	100	205,040.49	122	771,978.27	55	672,592.47	277	1,649,611.23
Large Water	-	-	6	150,015.00	18	693,004.00	24	843,019.00
TOTAL	13,473	2,420,061.71	3,528	1,336,565.93	1,447	1,739,809.73	18,448	5,496,437.37
GRAND TOTAL	79,936	12,625,412.08	9,654	10,365,922.39	4,892	8,159,012.63	94,482	31,150,347.10

# APPENDIX II DEVELOPMENT AND OPERATION OF COMMUNITY PASTURES UNDER PFRA, 1938-65

- 16 -

Fiscal Year	No. of Pasture Units in Opera- tion	Area of Land in Pastures (acres)	Total Cost of Construction of Pastures \$	Livestock Units Carried on Pastures	Acres per Unit of Live- stock	Cost of Operation		Net Operating cost per Unit of Livestock \$	Average Charge per Unit Livestock to Farmers \$
						Revenue \$	Operating Costs \$		
1938-39	14	189,800	165,995.03	3,231	58.7	6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1	21,632.71	20,945.84	1.82	1.82
1940-41	35	884,500	1,004,305.91	23,245	38.1	43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2	65,434.89	50,607.22	1.52	1.97
1942-43	45	1,261,100	1,129,487.54	51,127	24.7	98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3	111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,699,012.21	59,997	22.3	151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1	167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6	198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4	203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1	204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5	211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1	221,129.45	217,867.45	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4	335,327.16	237,742.13	3.08	4.34
1952-53	59	1,652,020	3,754,098.41	94,137	17.5	438,513.75	373,737.36	3.97	4.66
1953-54	60	1,678,736	3,963,572.83	109,583	15.3	507,179.14	490,907.89	4.48	4.55
1954-55	60	1,696,900	4,273,916.79	106,322	15.9	496,805.78	466,153.69	4.38	4.66
1955-56	60	1,728,700	4,509,668.59	108,499	15.8	499,045.13	501,540.73	4.67	4.60
1956-57	61	1,759,570	4,832,863.47	117,441	14.9	548,601.01	508,002.83	4.33	4.67
1957-58	61	1,796,275	5,119,317.01	119,398	15.0	552,938.40	607,129.23	5.08	4.63
1958-59	62	1,815,265	5,509,958.43	117,032	15.5	542,606.90	686,448.88	5.87	4.64
1959-60	64	1,818,464	5,800,342.43	124,812	14.6	705,785.32	742,915.21	5.95	5.65
1960-61	65	1,896,173	6,254,224.42	122,813	15.4	656,708.97	879,811.85	7.15	5.35
1961-62	68	2,088,704	6,845,655.79	146,672	14.2	860,808.25	1,128,255.75	7.69	5.87
1962-63	71	2,114,412	7,283,657.67	139,643	15.1	871,955.43	1,044,241.41	7.48	6.24
1963-64	75	2,149,292	7,677,379.13	141,723	15.2	1,168,641.26	1,193,820.31	8.42	8.25
*1964-65	83	2,318,477	8,826,041.14	156,978	14.8	1,460,278.94	1,396,513.51	8.90	9.30
						11,348,736.79	11,687,776.05		

A livestock unit indicates one head of cattle, one horse, or five sheep.

A pasture unit may include one or more pastures, but it is operated under one management.

\* Tax levy not included in revenue (1964-65 levy was \$157,768.02).



**APPENDIX III**  
**MAJOR PROJECTS – IRRIGATION, RECLAMATION AND WATER STORAGE**  
 (Projects by Special Votes of Parliament, Administered by PFRA)  
 to March 31, 1965

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
<b>MANITOBA</b>						
Assiniboine River Diking & Cut Off	Brandon	River Control	Incomplete	—	—	1,355,582
North-West Escarpment Reclamation Proj. – Riding Mt. Area	Dauphin	Watershed Control Flood Control	Incomplete 1960	—	—	1,304,460 287,751
Fairford River Project	Lake Manitoba			—	—	
Saskatchewan River Reclamation – Pasquia Area	The Pas	Reclamation	1960	135,000	—	2,256,388
Shellmouth Dam & Portage Diversion	Russell	River Control	Incomplete	—	430,000	935,489
<b>ALBERTA</b>						
Bow River (a) Purchase of Canada Land & Irrigation Company (b) Development & Construction	Medicine Hat	Irrigation	Incomplete	235,000	408,862	54,398
St. Mary Belly River Diversion	Lethbridge Lethbridge	Irrigation Irrigation	Incomplete 1950	510,000 —	320,000 —	2,353,182 21,998,647 21,236,133 53,901
<b>BRITISH COLUMBIA</b>						
Cawston Benches Chase & Johnston – Western Canada Ranching	Keremeos	Irrigation (pump)	1951	629	2,000	185,491
Western Canada Ranching #2	Kamloops	Irrigation	1951	755	—	98,243
Lillooet – Pemberton	Kamloops	Irrigation (pump)	1950	54	—	58,069
South Thompson – Niskonlith	Pemberton	River Control	1953	—	—	1,056,539
Gravity Project	Kamloops	Irrigation	Incomplete	1,030	1,200	12,282
Westbank Project	Kelowna	Irrigation	1950	1,200	2,500	537,450
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	—	32,229
Penticton West Bench	Penticton	Irrigation (pump)	1953	800	—	66,362
B.C. Fruitlands	Kamloops	Irrigation	Incomplete	2,000	—	200,000

(Above includes ONLY Construction Costs)

Name of Project	Location	Type of Project	Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs
SASKATCHEWAN						
South Saskatchewan River Project	Outlook	Multi-purpose	Incomplete	500,000 (Including 24,000 in Qu'Appelle extension)	-	81,093,909
Buffalo Pound Project	Qu'Appelle Valley	Urban Water Supply	1960	-	42,000	2,271,195
- Eyebrow Lake Diversion	Eyebrow	Water Supply	1960	-	-	98,376

(Above includes ONLY Construction Costs)



APPENDIX IV  
PFRA EXPENDITURES BY ACTIVITIES, 1935-65

ADMINISTRATION DIVISION

Ottawa and Regina Administration	\$ 3,779,327
----------------------------------	--------------

LAND USE SERVICE

Cultural Work - Soil Drifting, etc. (Exp. Farm Service)	4,966,394
Community Pastures - Construction, Operation and Maintenance	27,820,090
Movement of Settlers	227,841

WATER DEVELOPMENT SERVICE

Small Farm Projects	27,350,642
Community, Large Water Storage and Irrigation Projects	22,087,299
Supervision	5,321,757
Equipment - Purchase and Repairs, Service Depot	10,909,721
Tree Nursery Stations	855,968
Bow River Irrigation Project	34,024,910

ENGINEERING SERVICE

Surveys, Design, Soil Mechanics, Drainage Studies, Legal Surveys	
Supervision of Construction	26,089,526
St. Mary Irrigation Project	29,743,892
South Saskatchewan River Project	93,063,752
Assiniboine River Dyking	1,518,712
Shellmouth Dam and Portage Diversion	935,489
B.C. Reclamation and Development, including Lillooet Project	3,310,182
Land Protection and Reclamation, Manitoba and Eastern Canada	4,127,378
Miscellaneous Projects - Construction	4,921,357
	<u>\$301,054,237</u>

REVENUE:

Community Pasture Operations	\$12,024,423
Irrigation Project Operation & General Revenue	6,068,476
	<u>\$18,092,899</u>











Gov. Doc  
Can  
Ag

Canada Agriculture, Dept of Food  
Farm Rehabilitation Branch

CAI DA 20  
- A56

Report on

Prairie farm rehabilitation and related activities

1965

# ANNUAL REPORT

CANADA DEPARTMENT OF AGRICULTURE

1966







**ANNUAL REPORT**  
**ON PRAIRIE FARM REHABILITATION AND RELATED ACTIVITIES**

**1965 – 1966**

**CANADA DEPARTMENT OF AGRICULTURE**





# CONTENTS

	Page
INTRODUCTION .....	v
ORGANIZATION .....	vi
ADMINISTRATION DIVISION .....	1
Finance .....	1
Personnel .....	1
General Services .....	1
Information .....	1
Land .....	1
WATER DEVELOPMENT SERVICE .....	3
Field Services .....	3
Dugout Pumping .....	3
Emergency Community Well Drilling .....	3
Large Water-Storage Project Construction .....	3
Arborfield Dugout .....	3
Blood Indian Creek .....	3
Chain of Lakes (Willow Creek) Project .....	4
Elgin Dam .....	4
Melfort Storage Dam .....	4
Pilot Mound Dam .....	4
Irrigation Projects Developed, Operated and Maintained by PFRA .....	4
Rehabilitation, Southwest Saskatchewan .....	4
Bow River Project .....	4
Irrigation Demonstration Farm .....	5
Construction, Equipment and Supply Division .....	5
Tree Nursery Stations .....	6
LAND USE SERVICE .....	7
Pasture Operations .....	7
Grazing Allocations and Fees .....	7
Haying and Regrassing .....	7
Fires and Fire Protection .....	7
Breeding Service .....	8
Livestock Diseases .....	8
Livestock Insurance .....	8
Pasture Construction .....	8
Pasture Improvement .....	8
ENGINEERING SERVICE .....	9
Major Projects .....	9
South Saskatchewan River Project .....	9

## CONTENTS (continued)

	Page
St. Mary Project .....	10
Engineering and Construction .....	10
Improvement and Maintenance .....	10
Operation .....	10
Shellmouth Dam – Portage Diversion Flood Control .....	10
Regional Offices .....	11
Manitoba .....	11
Saskatchewan .....	11
Alberta .....	12
Technical Divisions .....	12
Design .....	12
Air Photo Analysis and Engineering Geology .....	13
Soil Mechanics and Materials .....	13
Hydrology .....	13
Legal Surveys .....	14
<b>APPENDICES</b>	
I Water Development Projects Completed and Assistance Paid, 1935-66 .....	15
II Development and Operation of Community Pastures under PFRA, 1938-66 .....	16
III Major Projects – Irrigation, Reclamation and Water Storage to March 31, 1966 .....	17
IV PFRA Expenditures by Activities, 1935-66 .....	19



## INTRODUCTION

The Prairie Farm Rehabilitation Act was passed by Parliament in 1935 to provide a four-year program for the rehabilitation of drought and soil-drifted areas of Manitoba, Saskatchewan and Alberta. By amendment in 1937, land utilization and resettlement were included, and in 1939 the Act was extended indefinitely.

Land use and water conservation on individual farms were originally the main activities qualifying for assistance under the Act, and are still important in the PFRA program. However, PFRA responsibilities over the years have expanded to include development of large-scale irrigation and reclamation projects, and a broad program of community pastures.

Other significant changes in the scope and functions of PFRA have occurred in recent years. In 1961, the program was extended to include all agricultural areas of the Prairie Provinces.

In 1963, the federal tree nurseries at Indian Head and Sutherland, Sask., were transferred to PFRA from the Research Branch. All aspects of the extensive tree-distribution program now are performed by PFRA.

PFRA also assists in administering and providing technical services for the Agricultural Rehabilitation and Development Act in Western Canada.

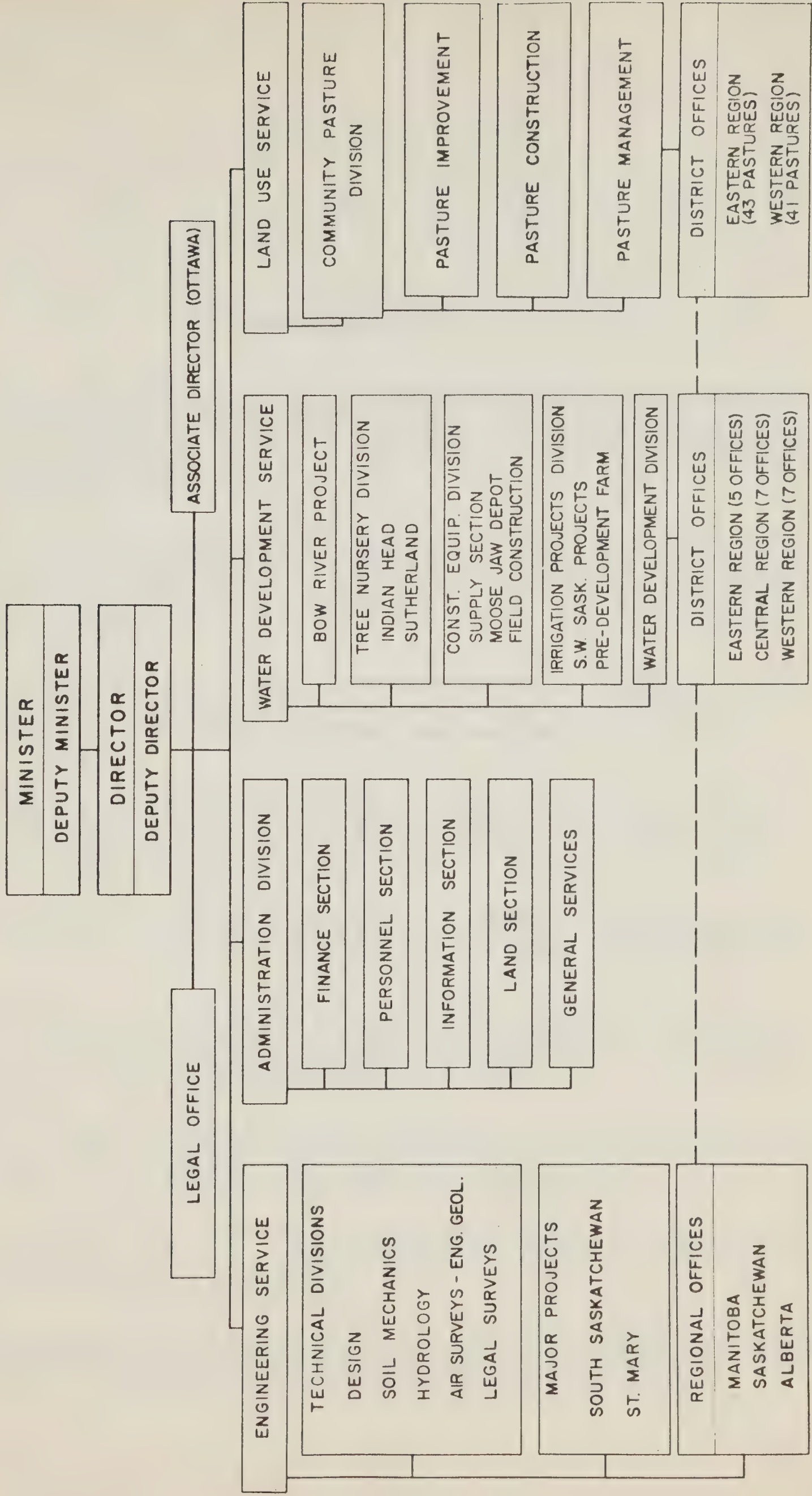
The following is a summary of activities of the Prairie Farm Rehabilitation Administration for the fiscal year ending March 31, 1966.





# P.F.R.A. ORGANIZATION

MARCH 31, 1966







## ADMINISTRATION DIVISION

Besides carrying out its regular work for PFRA in Canada, the Division last year looked after all the administrative details of establishing a PFRA team in Ghana. Planning got under way to provide administrative services to the new regional office of the Economics Branch of the Canada Department of Agriculture to be opened in Regina during the summer of 1966. Also, a start was made on plans to assist the regional ARDA office in Regina in the same way.

The Finance Section provides complete financial services, and in 1965-66 controlled and disbursed more than \$37 million in PFRA expenditures, while receiving \$2.2 million in revenue, mainly from community pasture and irrigation operations. Estimates of \$29 million in expenditures have been submitted for 1966-67. During the year the section also implemented the first phase of the responsibility center accounting system.

During 1965-66 the Personnel Section was responsible for a staff of 1,200 full-time and seasonal employees, and as many as 600 casual employees at one time. As part of its responsibility for the personnel management program in PFRA, it advised and guided management on many personnel administrative policies.

Arrangements are being made to establish a General Services Section which will bring under common management the present transcribing, central registry and office support services units. As well, a new data processing unit and a cost accounting unit will be incorporated into this section. It is expected these will go into operation during 1966-67.

The Information Section in 1965-66 continued its support of PFRA's technical program through exact scale reproduction work, time-study photography, rescaling of mosaics, and related technical photography.

It also arranged press conferences for government officials, conducted tours for the press and the public, and supplied speakers for several meetings. Six mobile displays, designed and produced by the section, were shown at 55 fairs, besides many meetings and conferences. Four permanent displays were redesigned and a new one made ready for EXPO '67.

The photographic unit filled 1,602 requests for services. The laboratory processed 7,184 black-and-white negatives and produced 33,000 prints. Ten thousand seven hundred feet of movie film were shot and edited, 800 color slides shot and filed and 7,000 duplicate slides distributed.

The library processed 1,197 accessions, circulated 206 periodicals and dealt with some 10,000 requests for information and publications. In addition, about 20,000 brochures were distributed from the South Saskatchewan River damsite tourist pavilion.

The Land Section continued to take responsibility for appraisal of and negotiation for all lands required for PFRA projects, while maintaining land records, issuing leases, and identifying property surplus to requirements. As of March 31, 1966, the PFRA land inventory was as follows:

LAND INVENTORY ON MARCH 31, 1966

Projects	Title	Easement, lease, etc.	Total
		(acres)	
Water conservation and reclamation			
Alberta	340		
Saskatchewan	20,798	1,935	
Manitoba	2,829	39	25,941
Minor irrigation			
Eastend	5,833		
Cypress Lake	5,329		
Maple Creek	10,688	50	
Swift Current	16,168		
Val Marie	10,502		48,570
Major irrigation			
St. Mary River	13,963		
Bow River	99,682	17,909	
(exchange lands)	9,468		
South Saskatchewan River	70,394	64,809	276,225
Community pastures			
Saskatchewan	1,196,035	567,095	
Manitoba	4,609	446,103	2,213,842
Miscellaneous			
(Tree nurseries, hydrometric site, pre-development farm, etc.)	1,234		1,234
Total	1,467,872	1,097,940	2,565,812



## WATER DEVELOPMENT SERVICE

The Water Development Service provides financial and technical assistance for the construction of farm and community water-conservation projects. It also assists in large water-storage and irrigation developments where there is a special need. Irrigation projects owned and operated by Canada in south-western Saskatchewan are administered by the Service, as are the Bow River project in Alberta, the Irrigation Demonstration Farm at Outlook, Sask., the Construction, Equipment and Supply Division, including its service depot at Moose Jaw, and the Tree Nurseries at Indian Head and Sutherland, Sask.

### Field Services

Light to moderate runoff occurred in the PFRA area in the spring of 1965. South of a line through Red Deer, Saskatoon, Melville and Brandon, runoff yields were much below normal, while north of this line runoff was near normal. Heavy rain storms in June and July added to the runoff. No urgent maintenance of projects was required.

The following table indicates field services provided in 1965-66.

Type of project	Preliminary calls	Inspections		Number of surveys	Plans prepared	Total services
		Final	Other			
Dugouts	1,277	1,859	653	—	—	3,789
Stock watering dams	266	168	523	299	264	1,520
Irrigation	618	115	868	400	259	2,260
Community	179	79	1,290	107	69	1,724
Combined	2,340	2,221	3,334	806	592	9,293
Total expenditure on individual projects: \$512,913						
Total expenditure on small community projects: \$114,271						

*Dugout Pumping.* Thirty-five million gallons of water were pumped at 119 western farms where there was a definite need. During July and August the pumping units were used in the Ottawa Valley in Ontario and Quebec to help irrigate market gardens and pastures suffering from severe drought.

*Emergency Community Well Drilling.* Twelve wells were drilled in Saskatchewan at a total cost of \$23,379, or an average of \$1,948 per well. The federal government's share of the cost was \$8,183.

### Large Water-Storage Project Construction

*Arborfield Project.* This project consists of a dam which creates a 1,310 acre-foot capacity reservoir, and a 30 acre-foot capacity dugout. The dugout is adjacent to Burntout Brook, one mile south-west of Arborfield, Sask., and provides a convenient water supply from which residents of the community can obtain water. It was completed in 1964. The dam, 10 miles south of the town, was completed in 1965. It will store water for livestock and domestic use as well as for replenishing the dugout. The dam, which is 28 feet high, is equipped with both drop inlet and emergency spillways, and riparian outlet works.

*Blood Indian Creek Project.* This project consists of an earthfill dam 52 feet high and 500 feet long, with an additional 1,900 feet of dykes whose maximum height is 21 feet. The dam, located 20 miles south of Youngstown, Alta., was completed in December 1965. It has a combined drop inlet spillway, riparian outlet and emergency spillway. The reservoir will hold 4,000 acre-feet of water for stock watering and supplemental irrigation of 400 acres of land downstream.

*Chain-of-Lakes Project.* Two earthfill dams are involved in this project, one at each end of a six-mile-long reservoir 20 miles southwest of Nanton, Alta. The north dam is 45 feet high and 1,200 feet long, while the south dam is 40 feet high and 1,800 feet long. Together they create a 12,000 acre-foot capacity reservoir using Willow Creek water. The south dam contains a gated reinforced concrete riparian outlet and an emergency spillway. Construction began late in 1964 and will be completed early in the 1966-67 fiscal year.

*Elgin Dam.* During the year an earthfill dam 30 feet high and 950 feet long was constructed on Elgin Creek, one mile east of the town of Elgin. It creates a reservoir capable of storing 500 acre-feet of water for stock watering. The dam is equipped with drop inlet and emergency spillways, as well as a gated riparian outlet.

*Melfort Storage Dam.* Construction began on this project in 1965 and the contract at March 31, 1966, was approximately 50 percent completed. The works consist of a 35-foot-high earth dam with a combined gated spillway and riparian outlet structure, and an emergency spillway. The 2,000 acre-foot capacity reservoir will provide domestic water for the community, stock watering, rural fire fighting services, and the Melfort Experimental Farm operated by the Canada Department of Agriculture.

*Pilot Mound Dam.* A dam 30 feet high and 500 feet long was constructed on Pilot Creek about three miles west of Pilot Mound, Man. The reservoir has a storage capacity of 450 acre-feet to meet the requirements of downstream residents owning 2,000 head of livestock. The dam is equipped with a drop inlet spillway and a grassed emergency spillway.

### **Irrigation Projects**

(Developed, operated and maintained by PFRA)

#### **Rehabilitation, Southwest Saskatchewan**

In this area, PFRA administers six irrigation projects containing 25,000 acres of land developed for irrigation. These are the Val Marie, West Val Marie, Eastend, Consul, Maple Creek and Swift Current projects. Water is provided from 25 PFRA reservoirs for these projects and eight other projects containing 15,000 acres operated by the province or under private lease. The main purpose of the projects over the past 25 years has been to produce forage for winter feeding of range cattle and breeding herds.

As part of a continuing improvement program, 1,179 acres of land were leveled in 1965. This program in the past has more than doubled production while combatting alkaline soil conditions.

In 1965 the six PFRA projects produced 47,500 tons of hay and 30,000 bushels of oats for the 560 farmers involved. This production supported 41,000 head of livestock.

#### **Bow River Project**

Bow River water for the irrigation of 120,000 acres was available from May 29 to October 21, 1965. Consumption dropped to 42,000 acre-feet from 108,000 acre-feet in 1964 because precipitation was above normal during the early growing period. Slightly more water was stored in reservoirs despite Little Bow reservoir being out of service for outlet structure repairs.

Spraying to control both surface and aquatic weeds in laterals and drains was again carried out, as was cleaning of about 38 miles of these channels to eliminate silt, drifted sand and cattails.

Other renovation and maintenance work, apart from reconstruction of the Little Bow reservoir headgates, included patching the East Arrowwood Siphon, repairing 4,000 feet of eroded main canal bank, and replacing 250 wooden canal and field structures with concrete structures.



New construction included laying half a mile of tile drain below the main canal, extending 12½ miles of lateral to bring an additional 1,500 acres of dry land under the ditch, excavating 19 miles of new drain and installing 80 precast concrete structures in leveled fields, as well as a variety of minor jobs.

Forage production was good although quality suffered from wet weather at first harvest. Grain yields were average. The number of sheep and cattle carried on farms was down due to unfavorable market prices, and because of the severe winter cattle entering community pastures were in poor condition.

A distinct change in specialty crop production occurred on slightly less acreage than in 1964-65. Of the 7,700 acres in these crops, more were in sugar beets and fewer in peas, beans and corn. Potatoes were grown commercially for the first time in the Hays district.

Hays area farmers numbered 131 at the end of the 1965-66 fiscal year, a decrease of five from a year earlier.

One new fencing loan brought the number of repayable housing, livestock and fencing loans to 166, worth \$159,480.

#### **Irrigation Demonstration Farm**

Many different grain and hay crops were again produced by a variety of techniques at the Irrigation Demonstration Farm at Outlook, Sask. This continuing program determines the types of irrigated crops that can be produced economically, and methods of irrigating them.

Corn and rape were the only specialty crops produced during the year. The corn yielded 15 tons of green forage per acre despite late seeding and cold weather during germination. Atroline was tried on this crop as a pre-emergence herbicide and was highly effective. Rape was grown in a seed-increase program for the Research Branch with good results, and will be continued for one more year.

Three types of livestock feeding were demonstrated: dry feeding in the feedlot, mechanical grazing, and limited grain finishing. More than 3,000 people visited the farm during the year.

#### **Construction, Equipment and Supply Division**

Organizational changes in this division during the past year have seen it divided into four parts: the Field Construction Section, the Safety Section, the Service Depot, and the Supply Section.

The field construction staff completed 110 jobs having a total value of \$406,000. The jobs included construction of timber structures; land leveling; fireguarding; dam and large dugout construction; building control structures; spillway repairs; polyethylene liner installation in canals and dugouts; reservoir dredging; channel blasting; cleaning, repairing and rebuilding irrigation canals; hauling and placing gravel and rock; constructing and graveling access roads; dismantling, moving and re-assembling steel buildings; building construction; installation of pumps, sewage mounds, lagoons and water systems; and other types of work.

The Safety Section emphasized personal safety through meetings and posters. Instruction in the use of fire fighting equipment and fire prevention was given, and inspection of buildings and equipment carried out. Oil wells operating on PFRA land were also inspected.

The Service Depot in Moose Jaw provided service with a total value of over \$500,000. It completed 355 general equipment repairs, 131 trailer repairs, and 488 repair jobs on vehicles. In addition, 179 pieces of equipment were either manufactured or modified.

The depot also filled 946 requests for trucking service, and hauled a variety of material 186,000 miles. In addition, it answered 128 requests for electrical, plumbing or heating services.

The Supply Section issued 432 purchase orders to a value of \$1,007,000. The section also investigated 41 accidents involving motorized equipment.

### **Tree Nursery Stations**

The Tree Nurseries at Indian Head and Sutherland distributed 10,223,000 trees to 10,594 farmers during the year. This represents an increase in trees distributed of 14.5 percent over the year before, and is the largest number of trees ever shipped. Of the total, 79.8 percent went to Saskatchewan farmers, 17.5 percent to Manitoba, and 2.5 percent to Alberta. Thirty-nine percent of the trees were used to plant farm home shelterbelts, while 61 percent were used in planting 1,196 miles of field shelterbelts.

Two new irrigation systems were installed at the Indian Head Nursery to permit the greater production needed to offset the loss of the Sutherland Nursery which will close during 1966.

The field season lasted from April 16 to November 18.



## LAND USE SERVICE

Amendment of the Prairie Farm Rehabilitation Act in 1937 gave sanction to the removal of submarginal land from cereal crop production, and its subsequent regrassing and development for grazing under a community pasture program. Continuous expansion of this program has brought to 84 the number of pastures operating in 1965. The total fenced area is 2,325,564 acres. During the summer season, 6,777 patrons grazed 157,854 cattle and calves, 223 horses and 1,783 sheep.

There are two major divisions and seven supervisory districts in the community pasture system. The eastern division has supervisory headquarters at Regina, Weyburn, Brandon and Dauphin; the western supervisory headquarters are at Swift Current, Kindersley and Saskatoon.

### Pasture Operations

Adequate spring runoff in 1965 filled most reservoirs and dugouts, and timely rains during the season resulted in excellent grazing in all areas. Cattle left the pastures in good condition. Grass and water carry-over were the best in many years.

The only new pasture operated was the 4,400-acre Pansy pasture near Gardenton, Man. The large Beaver Hills pasture was divided into two units. The Suffield pasture in Alberta was not in operation.

### Grazing Allocations and Fees

Initial grazing allocations are made by PFRA and reviewed by the Pasture Advisory Committees. Individual need, nearness to pasture, and past patronage constitute the basis for selection of patrons, with need being determined by a productive-man-work unit scoring system. Grazing permits issued are validated by each patron upon submission of two dollars per head of livestock for which space has been allocated. Grazing rates include a levy of one cent per head per day to reimburse the local government for loss of tax revenue on grazing land. Per-head fees for 1965 were:

- Cattle – 6 cents per day (including 1 cent tax levy)
  - Calves – \$3 per season (sucking with dam, born before August 1)
  - Horses – 8 cents per day (including 1 cent tax levy)
  - Colts – \$5 per season (sucking with dam, born before August 1)
  - Sheep – 12 cents per month (provide own herder)
  - Breeding Service – \$5 per cow
- Minimum grazing fees per head per season are: cattle \$5, horses \$7 and sheep 40 cents.

### Haying and Regrassing

Hay production in 1965 was 8,000 tons – double that of 1964 – although non-irrigated fields did not produce as heavily as anticipated, and rain caused some spoilage. Two new pasture irrigation schemes accounted for much of the increased production.

Tame grasses were sown on an additional 6,940 acres, bringing the total number seeded under this program to 197,504.

### Fires and Fire Protection

No serious losses to buildings or grass were experienced.

Motorized units maintained 1,220 miles of fireguard, and completed 42 miles of road which serve as fireguard.

### **Breeding Service**

The pasture breeding program serviced 51,348 cows in 1965, with 44,652 bred naturally and 6,696 bred artificially. This is double the number bred by A.I. in 1964. Of the 1,721 bulls used, 1,391 were PFRA stock and the balance were rented.

Yearling bulls purchased under the bull development program totaled 247, while 208 two-year-old bulls were also bought.

### **Livestock Diseases**

Although pinkeye and foot rot were quite prevalent, treatment was effective. The pastures continued to co-operate with the Health of Animals Branch in the control of brucellosis and tuberculosis.

### **Livestock Insurance**

Forty-nine pastures adopted mutual insurance covering all except contagious diseases and parturition at a cost of from 35¢ to \$1 per head. One pasture carried an individually optional type of insurance, and 34 pastures had no insurance.

### **Pasture Construction**

Fifty-one fencing projects requiring 121 miles of fence were completed. In all, 5,584 miles of fence, enclosing 2,325,564 acres, have now been constructed.

Other construction involved 10 corrals, 5 houses, and 33 miscellaneous buildings.

### **Pasture Improvement**

Ample runoff and above average rainfall resulted in plenty of stock water, excellent grass production and a good carry-over of grass.

New stock-watering facilities included 41 dugouts, one dam and 25 wells. In addition, a variety of water facilities and equipment were repaired or installed.

Bush clearing set a one-year record of 27,210 acres. Spraying for brush control involved 6,855 acres, while another 7,170 acres were cultivated and seeded to grass. A feature of the seeding program was the use of aircraft to seed 1,800 acres of land cleared by the ball and chain method and then burned. These areas were inaccessible to conventional equipment. A good catch of grass was obtained in this initial attempt at aerial seeding.

The pasture improvement section also maintained and operated irrigation projects for 10,000 acres.



## ENGINEERING SERVICE

The Engineering Service provides for the investigation, planning, design and construction of PFRA water development projects. It also gives technical assistance to other PFRA services operating and maintaining projects in which Canada retains an interest, and to several agencies engaged in planning and implementing major works in large river-basin developments of interprovincial or international scope. The principal agencies are the International Joint Commission, the Prairie Provinces Water Board, and the Greater Winnipeg Floodway Advisory Board.

The Engineering Service has major project offices at the St. Mary and South Saskatchewan River projects, and regional offices, each serving a prairie province, at Winnipeg, Regina and Calgary. The service also has technical divisions of design, hydrology, air photo and legal surveys at PFRA headquarters in Regina, and a soil mechanics and materials division in Saskatoon.

The offices at the two major projects supervise construction and carry out field planning. The regional offices conduct field investigations and over-all project planning, and supervise construction of projects ranging in size from community water storages to major works involving provincial participation. The technical divisions do the detailed planning, designing and other engineering work necessary for implementing projects.

### Major Projects

#### South Saskatchewan River Project

The South Saskatchewan River Dam, the largest earthfill dam in Canada, is the main structure on this multi-purpose water-conservation project located in south central Saskatchewan. It will store river flow for irrigation, power production, domestic and industrial use, and recreation. The main dam is situated midway between Outlook and Elbow, and a large secondary dam is located in the Qu'Appelle Valley.

Under a federal-provincial agreement signed in 1958, Canada is responsible for the planning, design and supervision of construction works required to create the reservoir, and pays most of these costs. Saskatchewan is responsible for part of these costs and for all other phases of development needed to make use of the water.

*Design and Planning.* Plans and specifications were prepared and tenders called for three contracts during 1965-66: miscellaneous works, railroad revisions, and supply of cement.

*Construction.* Satisfactory progress continued on all phases of construction. The main areas of work included a continuation of embankment construction on both the South Saskatchewan River and the Qu'Appelle River dams and building of the reinforced concrete spillway at the main dam.

Earth construction was carried out under two contracts on the South Saskatchewan River Dam. Close to 93 percent of the work on the embankment was completed by the end of the fiscal year. This involved the excavation of 112 million cubic yards of material and placement of 82 million cubic yards of compacted earthfill on the embankment. At the Qu'Appelle Dam 82 percent of the earth construction has been completed.

At the end of the fiscal year concrete work carried out totaled 520,870 cubic yards. The mass concrete spillway chute and stilling basin contract was 48 percent completed, while the crest section of the spillway was finished and the radial gates and hoists installed. Work on plugging the diversion tunnels was also completed and the cathodic protection system installed.



Other contracts included reservoir clearing, which was 95 percent completed, and a railroad revision, 70 percent completed. Materials supplied under cement and flyash contracts continued on schedule and the control gates and hoists for the Qu'Appelle River dam were delivered and are ready for installation in the conduit.

The value of contract work completed during the year amounted to 18.7 million dollars, bringing the total value of work done under contract to 96.7 million dollars. The labor force ranged up to 1,050 employees during the summer. Approximately 89,000 visitors viewed the construction area.

### **St. Mary Project**

Construction of works capable of delivering water for the irrigation of 500,000 acres on the St. Mary Irrigation Project in southern Alberta are nearing completion. Major storage reservoirs on the St. Mary and Waterton Rivers control the waters of these two rivers and also the Belly River, and release it for irrigation as required. Distribution works are presently in operation to serve 304,000 acres, with only a portion of the Waterton to Belly River diversion canal remaining to be built to bring the main works to completion.

Under a joint agreement, Canada provides the main storage, diversion and supply works, and pays for their engineering and construction. Alberta is responsible for the construction and operation of the distribution system, settlement, and agricultural development.

Canada delivers water at cost to a maximum of 25 cents per acre-foot. Alberta recovers a portion of its costs through a \$10-per-irrigable-acre levy paid by the farmers involved.

Gross cost to the federal government has been \$32,023,000, part of which is recoverable through water delivery charges. The project has cost Alberta \$21,084,000 for construction, operation and maintenance.

*Engineering and Construction.* During the year design work was carried out for structures on the Waterton to Belly River canal, and the High Line canal from Chin reservoir to Forty Mile reservoir. Survey, investigation, planning and design work was continued on distribution systems remaining to be built.

Construction included completion of equipment installation for Waterton Dam, and 90 percent of Contract #2 for the Waterton to Belly River canal.

*Improvement and Maintenance.* PFRA crews improved canal bank roads and other roads, lined 1,000 feet of main canal with polyethylene, and performed general maintenance work on structures, buildings and grounds.

*Operation.* Above normal precipitation during the growing season reduced the demand for irrigation water. Only 148,000 acre-feet of water were delivered as compared to the record 525,430 acre-feet in 1962.

Although the acreage of some specialty crops decreased, potato acreage rose by 20 percent. Livestock production also showed a considerable increase.

Reservoirs on the project are gaining in popularity as recreation spots.

### **Shellmouth Dam - Portage Diversion Flood Control**

An agreement with the Province of Manitoba provides for the construction of the Shellmouth Storage Dam and the Portage Diversion for flood control and water conservation on the Assiniboine River.



The Shellmouth Dam located near Roblin will create a 45-mile-long reservoir with a 400,000 acre-foot capacity. The structure will require the placement and compaction of 3,000,000 cubic yards of earth embankment and the pouring of 29,000 cubic yards of concrete for spillway and control works. The Portage Diversion to Lake Manitoba will consist of an 18.5-mile-long floodway with a flow capacity of 25,000 cubic feet per second. Canada is responsible for constructing the Shellmouth Dam, while the Province is responsible for the Portage Diversion.

Five contracts for stage construction of the Shellmouth Dam have been awarded. To March 31, 1966, 1,190,000 cubic yards, representing 40 percent of the embankment, had been placed, and 3,500 acres of reservoir clearing, equivalent to 85 percent, had been completed. Preparation of the foundation for the concrete structures was nearing completion. The total expenditure to the end of the fiscal year on the Shellmouth Dam was \$2,188,000, while on the Portage Diversion it was \$2,480,000.

### Regional Offices

During the year construction went forward on six projects, and investigations were conducted on 29. The following is a summary of activities of each regional office, with other details on construction activities to be found under "Water Development Service."

#### Manitoba

The regional engineering office in Winnipeg supervised construction of the Elgin Dam and Pilot Mound Dam, as well as the major Shellmouth Dam on the Assiniboine River.

As in past years, considerable maintenance and reconstruction were undertaken on the dyking system along the Assiniboine River between Portage la Prairie and Winnipeg. During the year 3.7 miles of dyke were raised, and another 1,800 feet of dyke completely rebuilt. Willows and grass were planted on new dyke to provide protection against erosion.

Investigations were completed for the renovation of the Upper Grandview reservoir and the proposed Timberton storage project on the Valley River, and Jackson Lake reservoir on Squirrel Creek. Studies were continued on the proposed Titterton and St. James storage sites on Birdtail Creek, a storage site on Birnie Creek, and the Victor storage project on the Qu'Appelle River. Studies were initiated for proposed flood control on the Roseau River.

Research work on the Wilson Creek experimental watershed continued. The project has been in operation on a nine-square-mile area since 1957. It is located on the eastern boundary of Riding Mountain National Park and is sponsored jointly by Canada and Manitoba. The purpose is to learn more about the action of flash floods on the steeply falling creeks of the escarpment, and the resulting characteristics of the heavy sedimentation on the lower reaches of the creeks. As in former years, the work entailed periodic metering of streams, measuring stream sediment, collecting climatological and stream flow data, studying vegetative growth, and experimentation in stream bank protection.

#### Saskatchewan

The regional engineering office in Regina continued to provide technical assistance on irrigation projects developed by PFRA in southwest Saskatchewan, while also performing supervisory and investigational duties on a wide range of water development projects.

Construction supervision was provided on the Arborfield and Melfort projects, and for improvements to the Ekapo, Avonlea, Brownhill, Altawan and Verwood projects.

Investigations included surveys and office studies on Brightwater Creek, Bedford Slough, Wynyard Dam, and several small water storage projects in west central Saskatchewan. Preliminary

engineering reports were prepared for the Alameda Dam, St. Claire Creek, Semerau and Wynyard projects. Investigations into flood control and irrigation measures on Wiwa Creek were completed and a preliminary report submitted, while flood control studies on Beaver River were continued. At the Indian Head Tree Nursery, design and construction supervision services were provided for extension of existing irrigation systems and other general improvements.

Preconstruction investigations for the preparation of contracts were continued for a large storage dam, a diversion tunnel, diversion dams and distribution systems for the rehabilitation of the irrigation systems of the Corporation of Penticton, B.C. One of five planned contracts was awarded at the end of the year. One engineer and three technicians were involved in these ARDA-financed projects.

Additional activities involved preparing a report on cathodic protection equipment required to control electrochemical corrosion in metal conduits, gates and pumps in existing projects; performing as-constructed surveys on seven existing private irrigation projects in western Saskatchewan; and drawing plans of existing works.

## Alberta

The Alberta regional office in Calgary supervised construction of the Blood Indian Creek and Chain of Lakes projects. Preliminary engineering reports were prepared for the Miller, Wabash Creek, Therriault, Pincher Creek, Kimball-Pinepound and Paddle River projects. Engineering investigations continued on the Three Rivers and Gap projects, and possible extension of the Bow River project. Preliminary investigations were initiated on the Snake Creek, Crossfield Creek, Little Bow River-Mosquito Creek and Red Deer Lake projects.

In 1964 a comprehensive economic and engineering study of Alberta irrigation districts was initiated under the ARDA program. The purpose of the study is to determine operating costs in relation to benefits irrigation projects bring to the economy. An engineering report on the Eastern Irrigation District was submitted in 1965, and work is continuing on reports relating to the Lethbridge Northern and Western Irrigation Districts.

## Technical Divisions

### Design

Planning, design and preparation of specifications and plans for the South Saskatchewan River Project and the Assiniboine River Project (Shellmouth Dam) were the two major undertakings of the division in 1965. Complete plans and specifications for the Elgin Project, the Helgason Dam, and the Indian Head Tree Nursery water storage works were also compiled.

The division prepared plans for repair of the Little Bow River outlet conduit on the Bow River Project, and did preliminary designs for feasibility studies on increasing storage in the Eastend and Pheasant Creek projects; for the Indian Farm Creek, Kenton, Semerau, St. Claire Creek, Watson Dam, Wiwa, Paddle River and Three Rivers Dam projects; and for a replacement structure for the Carseland Diversion Dam.

Plans and specifications were prepared for three contracts for the Corporation of Penticton in connection with the rehabilitation of its irrigation system under ARDA legislation.

The Hydraulic Laboratory operated by the division was fully utilized, with four major model studies undertaken.



### **Air Photo Analysis and Engineering Geology**

Air photo studies of land and water development proposals were carried out on Ribstone Creek in Alberta; and on Frenchman River and a proposed community pasture in the James Smith Indian Reserve in Saskatchewan. A large-scale land use survey covering 25,000 acres of the Paddle River flats in Alberta was also carried out using air photos.

Detailed geological studies and maps were completed on potential dam sites on Little Bow River and Mosquito Creek in Alberta, Frenchman River and Swan River in Saskatchewan, and Birnie Creek and the Qu'Appelle River in Manitoba. Geological studies and mapping of drift and bedrock strata revealed in deep excavations at the South Saskatchewan River Dam were continued during 1965.

Topographic surveys by photogrammetric techniques were completed for potential reservoirs on Crossfield Creek in Alberta, Battle Creek and Brightwater Creek in Saskatchewan, and Birnie Creek and Valley River in Manitoba. Additional photogrammetric mapping to support geological and legal surveys and design studies was also completed. Included was a detailed, large-scale survey of the Roseau River in Manitoba, to assist in flood-routing studies.

New aerial photographs were obtained for Parlby Creek, Paddle River, Pincher Creek and Oldman River in Alberta and the Qu'Appelle River in Saskatchewan. A program of periodic aerial photography of construction progress on the South Saskatchewan River Dam and Qu'Appelle River Dam was continued.

### **Soil Mechanics and Materials**

During the past year field exploration was carried out on 25 projects, involving 36,530 feet of drilling and the recovery of 8,331 samples. These soil samples were tested in the main laboratory at Saskatoon, where testing was also carried out on representative concrete specimens, sand and gravel samples from pits and stockpiles, and other construction materials such as cement, waterstop and reinforcing steel. In addition, field laboratories conducted tests at the Waterton, Shellmouth and Chain of Lakes projects for construction control purposes.

Reports were prepared dealing with the soil mechanics of 26 projects, and on 14 specialized laboratory or design studies. Plans and specifications were prepared for the Penticton and Shellmouth projects, and a portion of the South Saskatchewan River Dam.

A program was continued to evaluate the performance of embankments and structures on over 60 projects both under construction and in operation. Included in this program were special studies on frost action, swelling clays, drainage provisions, concrete durability and riprap performance.

### **Hydrology**

The work performed by this division included 30 water supply, 58 flood control and 14 miscellaneous studies. Some of the major studies were conducted in conjunction with the investigations of the proposed Paddle River flood control, the Roseau River flood control, the Penticton irrigation rehabilitation, and the Three Rivers and Gap reservoirs in the Old Man River basin. The division formulated operating rules for partially filling the reservoir at the South Saskatchewan River Dam in 1965, and for other studies related to this project.

Study requirements are becoming more complex, particularly for flood control problems. During the year use of electronic data processing was initiated. Several staff members attended a course in programming and, as a result, several programs have been developed and have proved of great value in solving the more complex and time-consuming problems.

The Hydrometeorological Section provided support for division studies. Regional analysis of snowfall, snow accumulation and melting were made to aid in the design of water-supply and control structures. Studies were made of reservoir evaporation loss, the thermal characteristics of reservoir water, and the relation of wind to shoreline protection.

Services to agencies other than PFRA were continued. Serving as Secretariat for the Prairie Provinces Water Board, the division conducted a number of studies relating to interprovincial water problems such as a comprehensive water supply study of the Assiniboine-Qu'Appelle watersheds, and assisted in the preparation of several reports for the P.P.W.B. A flood control study of the Roseau River is in progress for the International Joint Commission.

#### **Legal Surveys**

The division continued to contract out some work to private firms. Four such contracts were awarded in connection with small water projects, and the St. Mary and Milk Rivers development in Alberta, and one contract for monument re-establishment on 56.5 miles in the South Saskatchewan River Project.

A total of 106 miles was surveyed on community pastures in the Cowessess, Kahkewistahaw and Ochapowace Indian Reserves, and at Excel and Coalfields pastures.

A complete subdivision survey including lots, canals, drains and access roads was completed on the Nashlyn Irrigation Project. Revision surveys were performed on the Eastend, Consul, Val Marie, West Val Marie and Swift Current Irrigation Projects.

Miscellaneous surveys included work on the South Saskatchewan River Project reservoir and railway rights-of-way, Buffalo Pound Lake location, Welwyn Storage Project reservoir right-of-way and road diversion, West Poplar reservoir and Indian Head Tree Nursery.

Preparation and registration of all plans, together with processing about 125 requests for area and legal descriptions were completed.



# APPENDIX I

## WATER DEVELOPMENT PROJECTS COMPLETED AND ASSISTANCE PAID, 1935-66

Types of Project	DUGOUTS			DAMS			IRRIGATION PROJECTS			TOTALS	
	Completed	Assistance \$		Completed	Assistance \$		Completed	Assistance \$		Completed	Assistance \$
MANITOBA											
Individual	16,530	2,260,281.89		343	30,055.58		292	119,539.40		17,165	2,409,876.87
Neighbor	76	21,407.27		16	5,024.00		19	11,994.24		111	38,425.51
Small Community	9	18,062.16		25	134,401.87		2	30,582.54		36	183,046.57
Large Water	-	-		34	2,549,477.66		6	617,217.00		40	3,166,694.66
TOTAL	16,615	2,299,751.32		418	2,718,959.11		319	779,333.18		17,352	5,798,043.61
SASKATCHEWAN											
Individual	50,035	7,590,124.74		5,482	581,602.58		2,949	791,183.59		58,466	8,962,910.91
Neighbor	429	136,187.80		61	13,226.84		140	74,377.53		630	223,792.17
Small Community	449	522,577.24		213	1,107,148.99		71	680,639.78		733	2,310,366.01
Large Water	-	-		54	5,091,872.72		36	4,129,910.00		90	9,221,782.72
TOTAL	50,913	8,248,889.78		5,810	6,793,851.13		3,196	5,676,110.90		59,919	20,718,851.81
ALBERTA											
Individual	13,936	2,350,908.39		3,446	421,108.23		1,381	379,330.48		18,763	3,151,347.10
Neighbor	59	21,917.21		16	5,843.50		17	6,567.32		92	34,328.03
Small Community	109	229,398.86		122	776,891.95		58	678,746.29		289	1,685,037.10
Large Water	-	-		7	778,885.06		18	693,004.00		25	1,471,889.06
TOTAL	14,104	2,602,224.46		3,591	1,982,728.74		1,474	1,757,648.09		19,169	6,342,601.29
GRAND TOTAL	81,632	13,150,865.56		9,819	11,495,538.98		4,989	8,213,092.17		96,440	32,859,496.71

APPENDIX II  
DEVELOPMENT AND OPERATION OF COMMUNITY PASTURES UNDER PFRA, 1938-66

Fiscal Year	No. of Pasture Units in Operation	Area of Land in Pastures (acres)	Total Cost of Construction of Pastures \$	Livestock Units Carried on Pastures	Acres per Unit of Live-stock	Revenue \$	Operating Costs \$	Net Operating cost per Unit of Livestock \$	Average Charge per Unit of Livestock to Farmers \$
1938-39	14	189,800	165,995.03	3,231	58.7	6,339.92	10,185.52	3.15	1.96
1939-40	26	612,300	663,471.25	11,522	53.1	21,632.71	20,945.84	1.82	1.82
1940-41	35	884,500	1,004,305.91	23,245	38.1	43,451.56	35,291.05	1.52	1.87
1941-42	38	936,548	1,187,360.92	33,230	28.2	65,434.89	50,607.22	1.52	1.97
1942-43	45	1,261,100	1,129,487.54	51,127	24.7	98,292.32	79,906.76	1.56	1.92
1943-44	46	1,268,140	1,558,055.31	54,472	23.3	111,114.25	107,534.66	1.97	2.04
1944-45	49	1,337,320	1,699,012.21	59,997	22.3	151,461.08	117,064.90	1.95	2.52
1945-46	50	1,361,440	1,857,020.37	67,778	20.1	167,045.16	136,567.09	2.01	2.46
1946-47	53	1,412,860	2,072,274.21	68,493	20.6	198,115.27	145,292.51	2.12	2.89
1947-48	53	1,417,320	2,208,919.12	66,347	21.4	203,888.11	161,471.05	2.43	3.07
1948-49	54	1,436,480	2,486,277.28	71,393	20.1	204,012.40	175,666.27	2.46	2.86
1949-50	54	1,439,680	2,809,196.14	70,308	20.5	211,624.23	172,255.25	2.45	3.01
1950-51	56	1,521,080	3,237,330.55	68,858	22.1	221,129.45	217,867.45	3.16	3.21
1951-52	57	1,574,642	3,426,586.10	77,240	20.4	335,327.16	237,742.13	3.08	4.34
1952-53	59	1,652,020	3,754,098.41	94,137	17.5	438,513.75	373,737.36	3.97	4.66
1953-54	60	1,678,736	3,963,572.83	109,583	15.3	507,179.14	490,907.89	4.48	4.55
1954-55	60	1,696,900	4,273,916.79	106,322	15.9	496,805.78	466,153.69	4.38	4.66
1955-56	60	1,728,700	4,509,668.59	108,499	15.8	499,045.13	501,540.73	4.67	4.60
1956-57	61	1,759,570	4,832,863.47	117,441	14.9	548,601.01	508,002.83	4.33	4.67
1957-58	61	1,796,275	5,119,317.01	119,398	15.0	552,938.40	607,129.23	5.08	4.63
1958-59	62	1,815,265	5,509,958.43	117,032	15.5	542,606.90	686,448.88	5.87	4.64
1959-60	64	1,818,464	5,800,342.43	124,812	14.6	705,785.32	742,915.21	5.95	5.65
1960-61	65	1,896,173	6,254,224.42	122,813	15.4	656,708.97	879,811.85	7.15	5.35
1961-62	68	2,088,704	6,845,655.79	146,672	14.2	860,808.25	1,128,255.75	7.69	5.87
1962-63	71	2,114,412	7,283,657.67	139,643	15.1	871,955.43	1,044,241.41	7.48	6.24
1963-64	75	2,149,292	7,677,379.13	141,723	15.2	1,168,641.26	1,193,820.31	8.42	8.25
1964-65	83	2,318,477	8,826,041.14	156,978	14.8	1,460,278.94	1,396,513.51	8.90	9.30
*1965-66	84	2,325,564	9,274,172.20	158,434	14.7	1,431,951.80	1,348,564.90	8.51	9.04
						12,780,688.59	13,036,340.95		

A livestock unit indicates one head of cattle, one horse, or five sheep.

A pasture unit may include one or more pastures, but it is operated under one management.

\*Tax levy not included in revenue (1965-66 levy was \$167,492.70).



**APPENDIX III**  
**MAJOR PROJECTS – IRRIGATION, RECLAMATION AND WATER STORAGE**  
 (Projects by Special Votes of Parliament, Administered by PFRA  
 to March 31, 1966)

Name of Project	Location	Type of Project	Date Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs \$
MANITOBA						
Assiniboine River Diking & Cut Off	Brandon	River Control	Incomplete	—	—	1,401,485
North-West Escarpment Reclamation Proj. – Riding Mt. Area	Dauphin	Watershed Control	Incomplete	—	—	1,313,103
Fairford River Project	Lake Manitoba	Flood Control	1960	—	—	287,751
Saskatchewan River Reclamation – Pasquia Area	The Pas	Reclamation	1960	135,000	—	2,256,388
Shellmouth Dam & Portage Diversion	Russell	River Control	Incomplete	—	430,000	2,243,438
ALBERTA						
Bow River	Medicine Hat	Irrigation	Incomplete	235,000	408,862	54,398
(a) Purchase of Canada Land & Irrigation Company						2,353,182
(b) Development & Construction						22,314,402
St. Mary	Lethbridge	Irrigation	Incomplete	510,000	320,000	21,718,043
Belly River Diversion	Lethbridge	Irrigation	1950	—	—	53,901
BRITISH COLUMBIA						
Cawston Benches	Keremeos	Irrigation (pump)	1951	629	2,000	185,491
Chase & Johnston – Western Canada Ranching	Kamloops	Irrigation	1951	755	—	98,243
Western Canada Ranching #2	Kamloops	Irrigation (pump)	1950	54	—	58,069
Lillooet – Pemberton	Pemberton	River Control	1953	—	—	1,056,539
South Thompson – Niskonlith Gravity Project	Kamloops	Irrigation	Incomplete	1,030	1,200	12,282
Westbank Project	Kelowna	Irrigation	1950	1,200	2,500	537,450
Bankhead Irrigation Project	Kelowna	Irrigation	1951	92	—	32,229
Penticton West Bench	Penticton	Irrigation (pump)	1953	800	—	66,362
B.C. Fruitlands	Kamloops	Irrigation	Incomplete	2,000	—	200,000

(Above includes ONLY Construction Costs)

# APPENDIX III Continued

Name of Project	Location	Type of Project	Date Completed	Irr. Ac.	Stor. Cap. Acre Feet	Costs \$
SASKATCHEWAN						
South Saskatchewan River Project	Outlook	Multi-purpose	Incomplete	500,000 (Including 24,000 in Qu'Appelle extension)	-	101,097,965
Buffalo Pound Project	Qu'Appelle Valley	Urban Water Supply	1960	-	42,000	2,272,695
- Eyebrow Lake Diversion	Eyebrow	Water Supply	1960	-	-	98,376

(Above includes ONLY Construction Costs)



**APPENDIX IV**  
**PFRA EXPENDITURES BY ACTIVITIES, 1935-66**

ADMINISTRATION DIVISION

Ottawa and Regina Administration	\$ 4,329,997
----------------------------------	--------------

LAND USE SERVICE

Cultural Work – Soil Drifting, etc. (Exp. Farm Service)	4,966,394
Community Pastures – Construction, Operation & Maintenance	29,911,822
Movement of Settlers	227,841

WATER DEVELOPMENT SERVICE

Supervision, Individual Dugouts, Wells, Community,	
Large Water Storage and Irrigation Projects	57,623,507
Equipment – Purchase and Repairs, Service Depot	12,115,774
Tree Nursery Stations	1,424,461
Bow River Irrigation Project	35,327,436

ENGINEERING SERVICE

Surveys, Design, Soil Mechanics, Drainage Studies, Legal	
Surveys, Supervision of Construction	27,984,702
St. Mary Irrigation Project	30,537,894
South Saskatchewan River Project	114,236,357
Assiniboine River Dyking	1,564,615
Shellmouth Dam and Portage Diversion	2,243,438
B.C. Reclamation and Development, including Lillooet Project	3,310,182
Land Protection and Reclamation, Manitoba and Eastern Canada	4,136,021
Miscellaneous Projects – Construction	4,932,045
	<u>\$334,872,486</u>

REVENUE:

Community Pasture Operations	\$13,453,125
Irrigation Project Operation & General Revenue	<u>7,107,609</u>
	<u>\$20,560,734</u>











Canada

Prairie Farm Rehabilitation Administration

Annual Report

1966/67; 1967/68 lacking





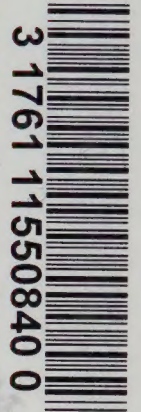






BINDING SEC.. OCT 7 1982





3 1761 11550840 0